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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
June 17, 1980. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,464,414, Re. S.N. 158,289, Filed Jun. 10, 1980, Cl. 128/272, MIXING VIAL CONSTRUCTION, Harry Sponnoble, Owner of Record: *The Upjohn Company, Kalamazoo, Mich.,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 335

3,559,383, Re. S.N. 148,685, Filed May 12, 1980, Cl. 55/472, BENCH STRUCTURE WITH BUILT-IN DUST COLLECTOR, James M. McCabe, Owner of Record: *Coe Laboratories, Inc., Chicago, Ill.,* Attorney or Agent: Robert E. Knechtel, et al., Ex. Gp.: 177

3,645,835, Re. S.N. 157,288, Filed Jun. 6, 1980, Cl. 428/195, MOISTURE VAPOR PERMEABLE PRESSURE SENSITIVE ADHESIVE MATERIALS, Martin E. Hodgson, Owner of Record: *T. J. Smith and Nephew Ltd., Yorkshire, England,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 164

3,702,843, Re. S.N. 156,494, Filed Jun. 4, 1980, Cl. 525/6, NITRITE, NITRATE AND SULFATE ESTERS OF POLYHYDROXY POLYMERS, Richard G. Schweiger, Owner of Record: *Inventor,* Attorney or Agent: Mario A. Martella, et al., Ex. Gp.: 144

4,017,596, Re. S.N. 148,052, Filed May 8, 1980, Cl. 424/1, RADIOPHARMACEUTICAL CHELATES AND METHOD OF EXTERNAL IMAGING, Michael Dewey Loberg, et al., Owner of Record: *Research Corporation, New York, N.Y.,* Attorney or Agent: Dennis P. Clarke, Ex. Gp.: 223

4,036,595, Re. S.N. 157,961, Filed Jun. 9, 1980, Cl. 422/248, CONTINUOUS CRYSTAL GROWING FURNACE, Robert E. Lorenzini, et al., Owner of Record: *Siltec Corporation, Menlo Park, Calif.,* Attorney or Agent: C. Michael Zimmerman, Ex. Gp.: 177

4,042,504, Re. S.N. 062,853, Filed Jul. 31, 1979, Cl. 210/107, SELF-CLEANABLE FILTER, Mordeki Drori, Owner of Record: *Inventor,* Attorney or Agent: Benjamin J. Barish, Ex. Gp.: 176

4,094,136, Re. S.N. 158,416, Filed Jun 11, 1980, Cl. 368/855, ELECTRONIC TIMEPIECE INSPECTION CIRCUIT, Hitomi Aizawa, Owner of Record: *Kabushiki Kaisha Suwa Seikosha, Chud-ku, Japan,* Attorney or Agent: Harold I. Kaplan, Ex. Gp.: 217

4,094,295, Re. S.N. 158,603, Filed Jun 10, 1980, Cl. 126/25 R, CHARCOAL AND WATER SMOKER AND COOKER, Burl Boswell, et al., Owner of Record: *Bosman Industries, Inc., Shreveport, La.,* Attorney or Agent: Harvey B. Jacobson, Ex. Gp.: 345

4,112,138, Re. S.N. 156,773, Filed Jun. 4, 1980, Cl. 427/054, MANIFOLD CARBONLESS FORM AND PROCESS FOR THE PRODUCTION THEREOF, Gerald T. Davis, et al., Owner of Record: *The Mead Corporation, Dayton, Ohio,* Attorney or Agent: Edward W. Goldstein, Ex. Gp.: 162

4,123,419, Re. S.N. 156,952, Filed Jun. 6, 1980, Cl. 260/45.8 NZ, STABILIZED THERMOPLASTIC POLYESTERURETHANES, Herbert L. Heiss, et al., Owner of Record: *Mobay Chemical Corporation, Pittsburgh, Pa.,* Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 144

4,156,999, Re. S.N. 156,774, Filed Jun. 4, 1980, Cl. 52/376, BEAM FOR CONCRETE FORMING STRUCTURES, Peter J. Avery, Owner of Record: *Aluma Systems Incorporated, Downsview, Ontario, Canada,* Attorney or Agent: Edward W. Goldstein, Ex. Gp.: 354

4,157,663, Re. S.N. 157,771, Filed Jun. 9, 1980, Cl. 73/361, AUTOMATIC THERMOCOUPLE REFERENCE JUNCTION COMPENSATOR, Eugene T. Ihlenfeldt, et al., Owner of Record: *The Boeing Company, Seattle, Wash.,* Attorney or Agent: T. H. Murray, et al., Ex. Gp.: 244

4,181,050, Re. S.N. 150,618, Filed May 14, 1980, Cl. 324/82, CAN CUTTING APPARATUS AND METHOD, Alphonse Stroobants, et al., Owner of Record: *Belgium Tool & Die Company, Lynchburg, Va.,* Attorney or Agent: Nathaniel A. Humphries, Ex. Gp.: 324

PATENT NOTICES

Certificates of Correction for the Week of Aug. 19, 1980

Re. 30,024	4,184,049	4,198,296	4,204,018
3,921,132	4,184,763	4,198,341	4,204,022
3,958,581	4,184,938	4,198,502	4,204,148
4,066,767	4,185,340	4,199,002	4,204,275
4,075,492	4,185,856	4,199,549	4,204,435
4,079,524	4,186,608	4,199,585	4,204,777
4,100,070	4,186,953	4,199,880	4,204,854
4,107,167	4,188,211	4,200,135	4,204,885
4,109,092	4,188,225	4,200,144	4,205,691
4,111,946	4,188,624	4,200,413	4,206,270
4,116,273	4,189,003	4,200,970	4,206,489
4,119,535	4,189,621	4,200,972	4,206,509
4,134,742	4,189,642	4,201,336	4,206,551
4,140,959	4,189,655	4,201,541	4,206,772
4,151,213	4,190,045	4,201,553	4,207,000
4,151,722	4,191,218	4,201,636	4,207,099
4,154,407	4,192,450	4,201,722	4,207,110
4,154,419	4,192,883	4,201,754	4,207,193
4,154,975	4,193,058	4,201,908	4,207,480
4,161,455	4,193,347	4,202,301	4,207,652
4,163,107	4,193,981	4,202,427	4,207,809
4,163,642	4,194,037	4,202,585	4,207,868
4,166,183	4,194,127	4,202,681	4,207,971
4,170,102	4,194,610	4,202,761	4,207,988
4,175,716	4,194,948	4,202,779	4,208,006
4,177,187	4,195,644	4,202,910	4,208,014
4,177,192	4,196,295	4,202,957	4,208,057
4,177,269	4,196,532	4,202,993	4,208,221
4,177,719	4,196,624	4,203,201	4,208,307
4,178,631	4,196,966	4,203,311	4,208,560
4,178,944	4,197,074	4,203,415	4,208,579
4,180,581	4,197,150	4,203,486	4,208,897
4,181,719	4,197,315	4,203,520	4,208,898
4,183,090	4,197,389	4,203,781	4,209,027
4,183,834	4,198,270	4,203,923	4,209,582
			4,210,114

Disclaimers

Re. 28,770.—*Barthel Zeunen*, Clarkston; *Rex C. Grace*, Troy; and *Alvie R. Dunn*, Madison Heights, Mich. PHOTOGRAPHIC EXPOSURE APPARATUS. Patent dated Apr. 13, 1976. Disclaimer filed June 20, 1980, by the assignee, *Capitol Reproductions, Inc.*

Hereby enters this disclaimer to claims 7 and 14 of said patent.

3,879,301.—*James W. Cairns*, Cherry Hill, N.J. LOW FRICTION BEARING MATERIAL AND METHOD. Patent dated Apr. 22, 1975.. Disclaimer filed June 17, 1980, by the assignee, *Garlock Inc.*

Hereby enters this disclaimer to claims 1–20 of said patent.

3,938,725.—*John H. Hardwick, William H. Jagoe, Carl W. Tonnesen*, Salem; and *Harold W. Jesse*, Amherst, N.H. METHOD OF MAKING ARTICLES SUCH AS ELECTRICALLY INSULATED HOUSING USING STRIPED LAMINATES. Patent dated Feb. 17, 1976. Disclaimer filed May 14, 1980, by the assignee, *TME Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,994,814.—*James W. Cairns*, Cherry Hill, N.J. LOW FRICTION BEARING MATERIAL AND METHOD. Patent dated Nov. 30, 1976. Disclaimer filed June 17, 1980, by the assignee, *Garlock Inc.*

Hereby enters this disclaimer to all claims of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each $10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–097,596. Face Plate for Cathode Ray Tube. Filed Nov. 27, 1979.

Patent application 6–104,924. Anti-Backlash Gear Drive. Filed Dec. 18, 1979.

Patent application 6–104,925. Heat Transfer Calibration Plate. Filed Dec. 18, 1979.

Patent application 6–105,363. Nonlinear Amplitude Detector. Filed Dec. 19, 1979.

Patent application 6–110,146. Vane Configuration for Fluid Wake Re-Energization. Filed Jan. 7, 1980.

Patent application 6–110,888. Energetic Monopropellant. Filed Jan. 10, 1980.

Patent application 6–110,889. Method and Apparatus for Analyzing Supersonic Flow Fields by Laser Induced Fluorescence. Filed Jan. 10, 1980.

Patent application 6–110,960. Low Volume, Lightweight, High Voltage Electron Gun. Filed Jan. 10, 1980.

Patent application 6–113,890. Statistical Method of Measuring the Differential Linearity of an Analog/Digital Converter Using a Pseudo-Random Triangle Wave Stimulus. Filed Jan. 21, 1980.

Patent application 6–114,541. High Absorption Coating. Filed Jan. 23, 1980.

Patent application 6–115,513. Improved Coaxial Cable Design. Filed Jan. 25, 1980.

Patent application 6–115,516. Composite Blade for Turbofan Engine Fan. Filed Jan. 25, 1980.

Patent application 6–115,843. Metallurgical Specimen Tester. Filed Jan. 28, 1980.

Patent 4,189,203. Circular Connector. Filed July 24, 1978. Patented Feb. 19, 1980. Not available NTIS.

Patent 4,189,527. Spherical Heat Pipe Metal-Hydrogen Cell. Filed Jan. 17, 1979. Patented Feb. 19, 1980. Not available NTIS.

Patent 4,190,273. Cabinet Lock Assembly. Filed June 6, 1978. Patented Feb. 26, 1980. Not available NTIS.

Patent 4,190,808. Amplifier-Oscillator Frequency Multiplier Apparatus. Filed Mar. 23, 1978. Patented Feb. 26, 1980. Not available NTIS.

Patent 4,190,815. High Power Hybrid Switch. Filed Mar. 9, 1978. Patented Feb. 26, 1980. Not available NTIS.

Patent 4,190,858. Method for Improved Performance of Infrared Vidicon Cameras. Filed Sept. 27, 1978. Patented Feb. 26, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administration Service Division Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–109,590. Optical Wood-Bark Segregator. Filed Jan. 4, 1980.

Patent 4,194,016. Process for Preparing Precooked Fruits and Vegetables. Filed Sept. 11, 1978. Patented Mar. 18, 1980. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patent Branch Westwood Bldg., Bethesda, Md. 20205

Patent application 6–094,088. 1,4-Bis(2'Phaloehtyl)-1,4-Diazabicyclo(2,2,1)-Heptane Dihydrogen Dimaleate and Selected Salts. Filed Nov. 14, 1979.

Patent 4,184,922. Dual Circuit, Woven Artificial Capillary Bundle for Cell Culture. Filed Nov. 11, 1977. Patented Jan. 22, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 6-078,251. Intense Electron Beam Microwave Switch. Filed Sept. 24, 1979.

Patent application 635,821. A Device for Minimizing Interchannel Crosstalk in High Rate Commutator Multiplexers. Filed. Nov. 28, 1975.

Patent application 670,816. High PRF Unambiguous Range Radar. Filed Mar. 26, 1976.

Patent application 691,924. Noise Resistant Zone Penetration Detection System. Filed June 1, 1976.

Patent application 699,923. Improved Molded Drag Reduction Coatings. Filed June 25, 1976.

Patent application 700,373. Coatings That Reduce Flow Resistance and Turbulent Drag at Their Interface With Liquids. Filed June 28, 1976.

Patent application 705,734. Cook-Off Liner Component. Filed July 15, 1976.

Patent application 706,705. Solid State Klystron. Filed July 19, 1976.

Patent application 719,493. Hydroways. Filed Sept. 1, 1976.

Patent application 719,779. Narrowband Wide Field of View Optical Filter. Filed Sept. 2, 1976.

Patent application 720,313. Rotary Expander Engine. Filed Sept. 3, 1976.

Patent application 720,314. Accommodating Device for Thermal Transient Expansions. Filed Sept. 3, 1976.

Patent application 724,831. Mechanism for Deep Ocean Instrumentation Remote Release. Filed Sept. 20, 1976.

Patent application 727,744. Electro-Optic Analog/Digital Converter. Filed Oct. 29, 1976.

Patent application 728,488. Recoil Simulator. Filed Sept. 30, 1976.

Patent application 729,052. Low-Loss Signal Coupler for Optical Communications and Integrated Optics. Filed Oct. 4, 1976.

Patent application 729,550. Frequency-Selective Loss Technique for Oscillation Prevention in Traveling-Wave Tubes. Filed Oct. 4, 1976.

Patent application 729,921. Battery Wedge for Submarines or Other Installations. Filed Oct. 6, 1976.

Patent application 731,471. Radar Signal Processor Utilizing a Multi-Channel Optical Correlator. Filed Oct. 12, 1976.

Patent application 733,626. A Device for Measuring the Velocity of a Body in an Undersea Environment. Filed Oct. 18, 1976.

Patent application 734,690. Magnetically Tuned, Surface Acoustic Wave Device. Filed Oct. 21, 1976.

Patent application 744,560. Frequency Multiplexed Water Leak Detection System. Filed Nov. 24, 1976.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–115,845. Multi-Channel Longtitudinal Video Tape Recording. Filed Jan. 28, 1980.

Patent 4,187,675. Compact Air-to-Air Heat Exchanger for Jet Engine Application. Filed Oct. 14, 1977. Patented Feb. 12, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administration Service Division Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–112,980. Biodegradable Starch-based Blown Films. Filed Jan. 17, 1980.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patent Branch Westwood Bldg., Bethesda, Md. 20205

Patent application 6–114,298. Unitized Three Leaflet Heart Valve. Filed Jan. 22, 1980.

Patent 4,192,584. System for Creating Motion Effects Employing Still Projection Equipment. Filed Aug. 15, 1978. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,196,085. Dialysis Solution Handling Device. Filed June 9, 1976. Patented Apr. 1, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 6–062,835. Integrated Wheelchair and Ambulator. Filed Aug. 1, 1979.

Patent application 6–084,253. A Radiation (Albedo) Power Converter. Filed Oct. 12, 1979.

Patent application 6–096,852. A System for Placing Freshly Mixed Concrete on the Seafloor. Filed Nov. 23, 1979.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent application 6–113,015. Precision Heat Forming of Tetrafluoroethylene Tubing. Filed Jan. 18, 1980.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Sunnyvale Patent Library*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
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	New York Public Library (The Research Libraries)	(212) 790-6291
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	Columbus: Ohio State University Libraries	(614) 422-6286
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	University Park: The Pennsylvania State Libraries	(814) 865-4861
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-16-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-2-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-3-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-29-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-20-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-3-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	8-8-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-21-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	6-7-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	2-7-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,095,572 to 3,099,836, inclusive
Plant Patents..... Numbers 2,269 to 2,270, inclusive

REISSUES

AUGUST 19, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,372

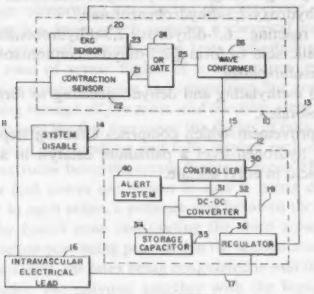
AUTOMATIC CARDIOVERTING CIRCUIT

Mieczyslaw Mirowski, Baltimore, Md.; Rollin H. Denniston, III, Golden, Colo., and Thomas E. Davis, Duluth, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Original No. 3,805,795, dated Apr. 23, 1974, Ser. No. 235,756, Mar. 17, 1972. Application for reissue May 1, 1978, Ser. No. 901,963

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—49 D **1 Claim**



1. Heart contraction sensing and stimulation circuit comprising:

a. first detecting means responsive to a change in a monitored electrical parameter produced by the normal beating action of the heart for providing a first identifiable electrical signal corresponding with each heart contraction;

b. second detecting means responsive to monitored heart electrical activity corresponding to heart contractions for providing a second identifiable signal corresponding with each heart contraction;

c. gating means electrically connected to receive electrical signals from said first and second detecting means, said gating means for providing an electrical output signal in response to either of said identifiable electric signals produced by a single heart contraction;

d. electrical energy storage means capable of storing sufficient energy to cardiovert a malfunctioning heart;

e. electrical energy source means;

f. control means connected in controlling relation to said energy storage means and said energy source means and operatively connected to said gating means and responsive thereto, said control means for controlling the transmission of electrical energy from said source means to said storage means only in the absence of electrical signals from both the first and second detecting means for a predetermined period of time;

g. output means adapted for connection to the heart;

h. regulating means connected in controlling relation to said energy storage means, said regulating means for permitting energy to be transmitted from said storage means to said output means when the energy stored by said storage means becomes greater than a predetermined level.

Re. 30,373

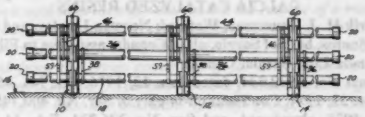
SHIPPING BUNDLE FOR NUMEROUS PIPE LENGTHS

Ferdinand J. Nist, Jr., Enumclaw, Wash., assignor to Seattle Box Company, Kent, Wash.

Original No. 4,099,617, dated Jul. 11, 1978, Ser. No. 769,542, Feb. 17, 1977. Application for reissue Dec. 1, 1978, Ser. No. 965,294

Int. Cl.[2] B65D *85/20*

U.S. Cl. 206—443 **12 Claims**



1. A shipping bundle formed of a plurality of lengths of pipe of a common size, comprising:

a base formed of a first plurality of transverse sleepers located in spaced-apart parallel arrangement;

a tier of pipe lengths resting on said base, adjacent pipe lengths of said tier being separated by blocks in transverse series, each block having opposed concavities substantially embracing the curved sides of said adjacent pipe lengths;

each of said series of blocks being located to stand on one of said sleepers and being of a height *substantially equal to or* greater than the thickness of the tier of pipe lengths;

a second plurality of sleepers, each traversing said pipe tier in overlying alignment with a sleeper of said first plurality, the sleepers of said second plurality being supported on the series of separating blocks; and

a bundling strap tightly encircling each sleeper of said first plurality, the separating blocks resting thereon, and the respective overlying sleeper.

Re. 30,374

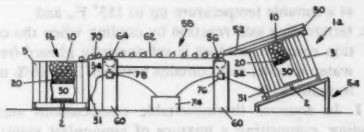
METHOD AND APPARATUS FOR STORING AND DISPLAYING FRUIT

Charles E. Spencer, 705 E. Main St., Fennville, Mich. 49408

Original No. 3,948,401, dated Apr. 6, 1976, Ser. No. 482,460, Jun. 24, 1974. Application for reissue Aug. 12, 1977, Ser. No. 823,994

Int. Cl.[2] B65G *65/04*

U.S. Cl. 414—404 **15 Claims**



12. An article storage, shipping and display apparatus comprising:

an upwardly open container structure having a plurality of sidewalls and a base portion;

a liner member positioned within said container structure between the sidewalls thereof and adapted to receive articles for display at the top of said container, said liner member comprising a flexible diaphragm, said diaphragm being adapted to receive articles and contain same within the confines of said sidewalls and said base; and

diaphragm displacing means within said container structure between said diaphragm and said base portion of said container structure, said displacing means being adapted for connection to a source of fluid and under the influence of fluid being capable of displacing said diaphragm within said container to move said diaphragm and the articles contained therein toward the top of the container as the articles are removed therefrom.

Re. 30,375
CALCIA CATALYZED RESINS

Hendrik H. J. Deuzeman, Watford; Norman Lumley, and Ruben A. Santos, both of Sarnia, all of Canada, assignors to Fiberglas Canada Ltd., Sarnia, Canada

Original No. 3,932,334, dated Jan. 13, 1976, Ser. No. 453,646, Mar. 21, 1974. Continuation-in-part of Ser. No. 400,145, Sep. 24, 1973, abandoned, and Ser. No. 226,234, Feb. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 44,616, Jun. 8, 1970, abandoned, said Ser. No. 400,145, is a continuation of Ser. No. 226,265, Feb. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 44,616, Jun. 8, 1970. Application for reissue Jan. 12, 1978, Ser. No. 868,877

Int. Cl.[2] **C08G** *51/24*

U.S. Cl. 260—29.3 **22 Claims**

1. A method for making an infinitely dilutable low phenol aqueous solution of thermosettable phenol formaldehyde resin, by selectively catalyzing and controlling the methylolation of phenol with formaldehyde to increase resinification, minimize the content of monomethylol phenols and higher phenyls and maximize the content of [o-p-dimethylol phenols] *2,4,6-trimethylol phenols*, thus producing a resin solution component for binder formulations having low air and wash water-polluting characteristics when applied to a substrate, comprising the steps of:

a. mixing U.S.P. phenol, in the absence of other monomers, with aqueous formaldehyde, in an amount of 3.5 to 4.5 of moles of formaldehyde per mol of phenol, and correspondingly up to about 10 moles of water per mol of the reactants, at a temperature not exceeding about 85° F., and,

b. introducing calcium oxide or calcium hydroxide catalyst, with cooling in an amount of 4.9 to 7 percent as calcium (Ca) based upon the weight of phenol, (0.11 mol to 0.16 mol calcium (Ca) per mol of phenol),

c. controlling the exothermic rise in the temperature of the reactants without heat input so as to increase to not more than about 125° F. during at least the first hour of reaction,

d. continuing the methylolation reaction without heat input at a suitable temperature up to 155° F., and

e. terminating said reaction by cooling when the condensation reaction product is substantially phenol-free, is still water soluble, and contains between 3 to 16% unreacted formaldehyde.

11. In aqueous thermosettable compositions suitable for bonding, comprising a mixture of aminoplast resins of nonphenolic monomeric materials capable of co-condensing with formaldehyde, a phenol formaldehyde resin, ammonia or a water soluble amine, an acidic curing catalyst, and water, the improvements comprising: the phenol formaldehyde resin is present in the form of an aqueous solution of a thermosettable phenol formaldehyde condensation resin made according to the method of claim 1, the pH of the composition is in the range of about 7 to 9, the acidic catalyst is present in an amount of 0.1 to 2 percent by weight based on the weight of the resin components, and the water is present to a solids content in the range of 1–80 percent by weight.

Re. 30,376
8-METHOXYPSORALEN

Louis J. Glunz, and Donald E. Dickson, both of Chicago, Ill., assignors to Thomas C. Elder, Inc., Hamilton, Ind.

Original No. 4,129,575, dated Dec. 12, 1978, Ser. No. 676,302, Apr. 12, 1976. Application for reissue Aug. 20, 1979, Ser. No. 68,011

The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.

Int. Cl.[2] **C07D** *311/78*

U.S. Cl. 260—343.21 **15 Claims**

1. In a process for making 8-methoxypsoralen from pyrogallol in the following steps:

(1) reacting pyrogallol with chloracetic acid to form ω-chloro-2,3,4-trihydroxyacetophenone,

(2) heating ω-chloro-2,3,4-trihydroxyacetophenone in the presence of a hydrogen chloride acceptor to form 6,7-dihydroxycoumaranone,

(3) hydrogenating 6,7-dihydroxycoumaranone to form 6,7-dihydroxy-2,3-dihydrobenzofuran,

(4) reacting 6,7-dihydroxy-2,3-dihydrobenzofuran with malic acid to form [2,3-dihydroxanthotoxol] *4',5'-dihydroxanthotoxol,*

(5–6) methylating and dehydrogenating to form 8-methoxypsoralen,

the improvement which comprises effecting step 3 with elemental hydrogen over a palladium catalyst in a solution of acetic acid in ethyl acetate.

Re. 30,377
PROCESS FOR MAKING ω-CHLORO-2,3,4-TRIHYDROXYACETOPHENONE

Louis J. Glunz, and Donald E. Dickson, both of Chicago, Ill., assignors to Thomas C. Elder, Inc., Hamilton, Ind.

Original No. 4,129,576, dated Dec. 12, 1978, Ser. No. 699,466, Jun. 24, 1976. Continuation of Ser. No. 676,302, Apr. 12, 1976. Application for reissue Aug. 20, 1979, Ser. No. 68,012

The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.

Int. Cl.[2] **C07D** *311/78;* **C07C** *49/78*

U.S. Cl. 260—343.21 **10 Claims**

1. In a process for making 8-methoxypsoralen from pyrogallol in the following steps:

(1) reacting pyrogallol with chloroacetic acid to form ω-chloro-2,3,4-trihydroxyacetophenone,

(2) heating ω-chloro-2,3,4-trihydroxyacetophenone in the presence of a hydrogen chloride acceptor to form 6,7-dihydroxycoumaranone,

(3) hydrogenating 6,7-dihydroxycoumaranone to form 6,7-dihydroxy-2,3,-dihydrobenzofuran,

(4) reacting 6,7-dihydroxy-2,3-dihydrobenzofuran with malic acid to form [2,3-dihydroxanthotoxol,] *4',5'-dihydroxanthotoxol,*

(5–6) methylating and dehydrogenating to form 8-methoxypsoralen,

the improvement which comprises[,] *(a):* effecting step 1 with boron trifluoride as the condensing agent and a two-fold excess of chloroacetic acid, [in which] *and (b): effecting* the hydrogenation of 6,7-dihydroxycoumaranone [is effected] with elemental hydrogen over a palladium catalyst in a solution of acetic acid in ethyl acetate.

Re. 30,378

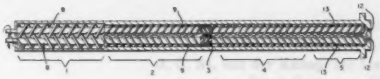
PROCESS FOR RECOVERY OF POLYMERS FROM THEIR DISPERSIONS IN LIQUIDS

Archie R. Bice, Landenberg, Pa., and Donald K. Burchett, Louisville, Ky., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Original No. 4,136,251, dated Jan. 23, 1979, Ser. No. 832,354, Sep. 12, 1977. Application for reissue Jun. 25, 1979, Ser. No. 51,974

Int. Cl.[2] **C08F** *6/22, 6/24*

U.S. Cl. 528—486 **11 Claims**



1. A process for recovering a polymer from a dispersion in a liquid medium comprising introducing the dispersion, and, if the dispersion is a latex which requires a chemical means of coagulation, separately introducing a latex coagulating agent, into a first zone of screw flights of a twin screw extruder having counter-rotating screws and comprising five zones; *one screw extending through all five zones, and the other screw extending through at least the first four zones;* the flights of both screws in the first zone intermeshing and fully wiping each other as well as the extruder bore; the screw flights in zones **2**[,] *and* **4**, and *when both screws are present in zone* **5**, being disposed tangentially to each other, a pressure seal between the second zone and the fourth zone constituting the third zone, and a liquid evacuation port being provided in the second zone; if the dispersion is a latex, the latex being coagulated in said first zone of the extruder; the polymer together with the liquid being conveyed by the positive displacement of the screws from said first zone into said second zone, the pressure in said second zone being sufficiently high to allow the polymer to pass through the pressure seal, while the liquid flows back and out through the evacuation port; the polymer in said fourth zone of the extruder being subjected to subatmospheric pressure in order to remove a major portion of liquid still held by the polymer; and the substantially dry polymer being conveyed out of the extruder by the pumping action of the screws.

Re. 30,379

ETHEREAL MONOSUBSTITUTIONS OF MONOSACCHARIDE DERIVATIVES

Paul Gordon, Chicago, Ill., assignor to Strategic Medical Research Corp., Greenwich, Conn.

Original No. 3,939,146, dated Feb. 17, 1976, Ser. No. 424,786, Dec. 14, 1973. Continuation-in-part of Ser. No. 337,134, Mar. 1, 1973, Pat. No. 3,939,145. Application for reissue Feb. 17, 1978, Ser. No. 878,937

Int. Cl.[2] **C07H** *15/00*

U.S. Cl. 536—4 **31 Claims**

24. A compound having the formula S—O—Y, and therapeutically effective and pharmaceutically acceptable organic acid and inorganic acid salts thereof, wherein S is the residue of a monosaccharide selected from the group consisting of pentoses, hexoses and heptoses which has been derivatized with at least one substance selected from the group consisting of (a) at least one aliphatic alcohol containing 1–18 carbon atoms to produce an ether group at the site of at least one available hydroxyl group, (b) at least one aldehyde containing 1–18 carbon atoms to produce at least one acetal group at the site of at least one available hydroxyl group, (c) at least one ketone containing 1–18 carbon atoms to produce at least one ketal group at the site of at least one available hydroxyl group, and (d) at least one organic acid residue containing 1–18 carbon atoms to produce an ester group at the site of at least one available hydroxyl group, and Y is selected from the group consisting of -(N',N'-dimethylamino-n-propyl), -N',N'-dimethylaminoisopropyl), -(N'-methylpiperidyl), -(N',N'-dimethylaminoethyl), -(2',N',N'-trimethylamino-n-propyl), -(N',N'-dimethylaminomethyl), -(N',N'-dimethylaminopropyl), -(N',N'-dimethylamino-iso-butyl), -(N',N'-dimethylamino-n-butyl), -(N',N'-dimethylamino-iso-pentyl), -(N',N'-dimethylaminopentyl), -(N'-methylamino-n-propyl), -(N'-methyl-N'-ethylamino-n-propyl), -(N',N'-diethylamino-n-propyl), -(N'-ethylamino-n-propyl), -(N'-propylamino-n-propyl), -(N',N'-iso-propylamino-n-propyl), -(1',2'-ethylimino-n-propyl), -(1''-n-propylpyrrolidyl), -(1''-n-propylpiperidyl), -piperidyl, -(N',N'-dimethylamino-sec-butyl), -(methylpiperidyl), -(methylpyrrolidyl) and -(N',N'-dimethylamino-1,2-propenyl).

PLANT PATENTS

GRANTED AUGUST 19, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,588

CHRYSANTHEMUM NAMED EARLY YELLOW

J. C. M. van der Knaap, De Lier, Netherlands, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Feb. 21, 1979, Ser. No. 13,302

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by its vigorous and rapid growth habit, its year-around uniform flowering response, and its early 7 to 8 week photoperiodic response.

PATENTS

GRANTED AUG. 19, 1980

ERRATA

For CLASS	See PATENT NO.
368–076	4,217,751
368–289	4,217,752
368–324	4,217,753
410–121	4,217,831
055–106	4,218,232
430–126	4,218,246
430–078	4,218,247
528–143	4,218,366
556–472	4,218,387
568–321	4,218,400
568–402	4,218,401
568–428	4,218,403
528–339	4,218,509
370–081	4,218,587
370–059	4,218,588
370–013	4,218,589
370–097	4,218,654
455–039	4,218,655
455–059	4,218,656
455–182	4,218,657
455–603	4,218,681
340–149 R	4,218,690
357–072	4,218,701
340–065	4,218,763

PATENTS

GRANTED AUG. 19, 1980

ERRATA

Re CLAIM	PATENT NO.
358–378	4,217,727
379–389	4,217,728
388–424	4,217,729
410–423	4,217,730
022–106	4,217,731
429–434	4,217,732
410–478	4,217,733
529–543	4,217,734
750–802	4,217,735
768–751	4,217,736
768–802	4,217,737
806–828	4,217,738
528–739	4,217,739
770–981	4,217,740
970–996	4,217,741
770–815	4,217,742
770–997	4,217,743
455–459	4,217,744
455–499	4,217,745
479–483	4,217,746
484–503	4,217,747
504–749 R	4,217,748
727–772	4,217,749
765–983	4,217,750

PATENTS

GRANTED AUGUST 19, 1980

GENERAL AND MECHANICAL

4,217,662

COMFORTER AND ROBE COMBINATION

Alex Buchman, New York, N.Y., assignor to Barclay Home Products, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 897,187, Apr. 17, 1978. This application Jul. 20, 1978, Ser. No. 926,547

Int. Cl.[2] A41B *9/00*; A41D *9/00*

U.S. Cl. 2—69.5 **2 Claims**

1. A comforter and robe combination comprising:

a blanket-like body member having top, bottom and opposite side edges;

first closure means disposed on a lower portion of said body member to releasably secure a lower half portion of one side edge to a corresponding lower half portion of the other side edge;

second closure means disposed on said bottom edge to releasably secure said bottom edge to itself;

first fastener means at each upper corner for attachment to associated second fastener means, said second fastener means being respectively disposed on upper half portions of said opposite side edges adjacent to said closure means;

said first and second fastener means positioning each of said upper half portions in a folded condition to define a pair of sleeve portions on said body member, each sleeve portion having a predetermined maximum sleeve opening;

adjustment means disposed on each of said upper half portions of said side edges between said first and second fastener means for securing intermediate portions of each upper half portion together to obtain a preselected sleeve opening smaller than said maximum sleeve opening;

said adjustment means being snap fasteners;

said first and second fastener means being snap fasteners;

said snap fasteners of said adjustment means including male and female snap portions extending outwardly from an inside surface of said body member, said snap fasteners of said first fastener means including female snap portions extending outwardly from said inside surface of said body member, and said snap fasteners of said second fastener means including male snap portions extending outwardly from an outside surface of said body member;

said first closure means on said side edges including a zipper fastener extending to said bottom edge; and

said second closure means on said bottom edge including snap fasteners.

4,217,663

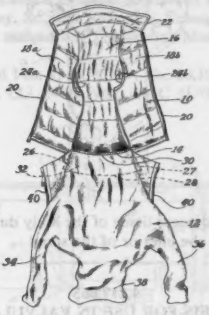
VEST

David B. Goldberg, 3017 Greenleaf, Wilmette, Ill. 60091, and J. W. Baker, 709 Alexander St., Paris, Ill. 60704

Filed Jun. 18, 1979, Ser. No. 49,646

Int. Cl.[2] A41D *1/04, 3/02*

U.S. Cl. 2—102 **13 Claims**



1. An outerwear garment which comprises:

a sleeveless vest for surrounding the upper body and comprising a back portion, a front portion and closure means for closing said front portion;

said back portion carrying a kidney extension flap at its lower end, said kidney extension flap having an interior portion defining a pouch;

a jacket for selectively surrounding the upper body and comprising a back jacket portion, a front jacket portion, a pair of sleeves and means for closing the front jacket portion;

the lower end of said jacket being connected to said vest adjacent said pouch, whereby said jacket portion may be inserted into said pouch or said jacket portion may be withdrawn from said pouch and the jacket sleeve may be inserted through side openings defined by said sleeveless vest.

4,217,664

PROSTHESIS AND METHOD FOR CREATING A STOMA

Joseph M. Faso, 518 Montmarc Dr., Erie, Pa. 16508

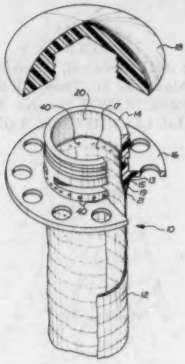
Filed Feb. 2, 1979, Ser. No. 8,492

Int. Cl.[2] A61F *1/00, 5/44*

U.S. Cl. 3—1 **18 Claims**

12. A prosthesis for implantation in a body wall for cooperating with a body duct to provide a stoma, said prosthesis comprising a flexible sleeve of biocompatible mesh material for being wrapped about a portion of the body duct passing through an opening in a body wall, a relatively rigid tubular spout of nonporous biocompatible material, said relatively rigid tubular spout having a proximal end designed for implantation in the body wall and said flexible sleeve being connected with said proximal end of said spout for implantation therewith in the body wall, said tubular spout having an inner surface circumscribing the inside thereof, said spout having a layer of

mesh of biocompatible material on the inside thereof disposed to engage the body duct to promote in-growth of connective tissue from the adjacent tissue of the body duct and to anchor the body duct in the interior of the spout.



4,217,665

PROSTHESIS FOR USE IN VALVULOPLASTY

Jean Pierre Bex, Paris, and Claude Mantel, Limours, both of France, assignors to Societe d'Utilisation Scientifique et Industrielle du Froid - Usifroid, Boulogne-Billancourt, France

Filed Jun. 22, 1976, Ser. No. 698,775
Claims priority, application France, Jun. 23, 1975, 75 19506
Int. Cl.[3] A61F *1/22;* A61B *17/00*
U.S. Cl. 3—1.5 **11 Claims**

1. A prosthesis for use in valvuloplasty comprising a linear reducer made of a material which is compatible with the implantation, which in the direction of its length is incompressible and inextensible but in the direction of its width is sufficiently flexible to assume a radius of curvature identical with that of the valvules, which can have needles introduced into it without tearing, which cannot be torn by the traction effect of suture threads, and of which the reduction ratio is governed by the distension of the deficient valvule.

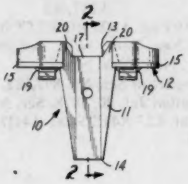
4,217,666

TIBIAL PROSTHESIS HAVING A U-SHAPED INTRAMEDULLARY STEM

Robert G. Averill, Ringwood, N.J., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 5, 1979, Ser. No. 27,518
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.911 **10 Claims**

1. A tibial prosthesis for interaction with a femoral prosthesis having a central slot therein for passage of the cruciate ligaments, said tibial prosthesis comprising a generally U-shaped tibial plateau platform, a bearing insert removably attached to each leg of said U-shaped platform for sliding contact with the condylar surface of said femoral prosthesis, an intramedullary fixation stem attached to said platform along one edge thereof, said stem having a generally tapered U-shaped cross section, the attachment area of said stem to said platform being U-shaped to thereby define a central opening to allow for passage of and permit unimpeded action of the cruciate ligaments.

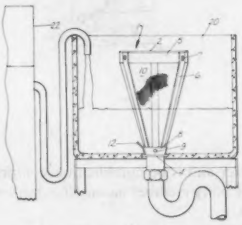


4,217,667

DRAIN LINT SEPARATOR AND STRAINER

Stanley W. Whitehouse, 8015 S. Clippinger Dr., Cincinnati, Ohio 45243

Filed May 4, 1979, Ser. No. 35,949
Int. Cl.[3] A47K *1/14;* E03C *1/26*
U.S. Cl. 4—286 **8 Claims**



1. A lint separator and filter device for preventing clogging of waste water drain openings by lint and other solid material discharged from a clothes washer or the like comprising:

a hollow tubular body portion having an open upper end forming an overflow opening, an open lower end spaced from said upper end for passing filtered waste water to the drain, and a screen-like wall containing a plurality of perforations extending substantially from said upper opening to said lower opening, said perforations being dimensioned to permit the passage of waste water but prevent the passage of lint and other solid material to the interior of said device; and

means attached to said lower end for connecting said device to the drain;

the passageway extending between said upper end and said lower end permitting the unobstructed passage of water and solid material to said drain from waste water overflowing said upper end.

4,217,668

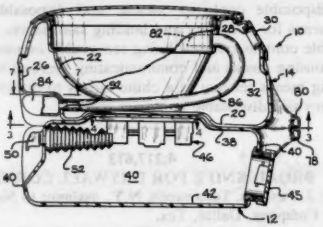
PORTABLE TOILET

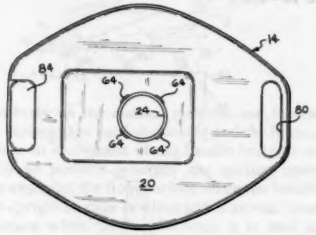
Charles L. Sargent, Ann Arbor; John A. Hoffman, Brighton; John M. Antos, and Arthur W. Henke, both of Ann Arbor, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Sep. 20, 1979, Ser. No. 77,175
Int. Cl.[3] E03D *5/012, 5/01, 11/10*
U.S. Cl. 4—321 **15 Claims**

1. A portable toilet comprising a portable lower holding tank section and a portable upper seat section removably stacked thereon, said seat section having walls defining a flush water storage tank and a toilet bowl which has an oulet port at its bottom, and having flush apparatus for discharing flush water

from the storage tank into the bowl, said holding tank section having a top wall and side and bottom walls forming a closed receptacle with an inlet port in its top wall in registry with said outlet port, and having a valve assembly that defines said inlet port and is operable for opening and closing said inlet port, characterized in that said holding tank and seat sections have parting surfaces respectively at their top and bottom walls





which are located generally in a flat plane, said sections having handles for carrying purposes, said handles being in engagement with each other at a location essentially in said plane so that they function as a unitary handle for the purpose of carrying the portable toilet with the sections in stacked-together relationship, said sections then also being joined together with said outlet port extending in registry into said inlet port.

4,217,669

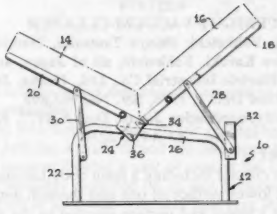
CONVERTIBLE SEAT

Frank J. Fefferman, Thousand Oaks, Calif., assignor to Stylar Industries, Inc., Burbank, Calif.

Filed Mar. 27, 1978, Ser. No. 890,320

Int. Cl.[2] A47C *17/10*

U.S. Cl. 5—47 **2 Claims**



1. A convertible seat comprising:

a seat base having a primarily horizontal track that extends at a rearward-downward incline;

a seat back member;

a seat bottom member;

a coupling pivotally connecting said members, and longitudinally slideably along said track formed on said base to slidably contact different locations along said track; and

a pair of links respectively coupling said back and bottom members to said base;

said base including a bracket mounted at the rearward end of said track with its top at the height of the top of the track, and positioned to support the rearward portion of said seat back member when it lies horizontal.

4,217,670

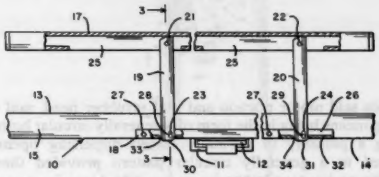
FOLDABLE RAIL ASSEMBLY

Edward S. Sciongay, Sr., and Edward S. Sciongay, Jr., both of Monroe, Conn., assignors to The Shelton Manufacturing Co., Shelton, Conn.

Filed Feb. 7, 1979, Ser. No. 10,107

Int. Cl.[2] A47D *7/02;* **A47C** *21/00*

U.S. Cl. 5—425 **4 Claims**



1. A foldable rail assembly adapted to be attached to the edge of an element having a horizontal surface and adapted to be adjusted vertically between upright position in which it extends above said surface to provide a vertical barrier for said surface, and folded position in which it occupies a minimum of space at said edge and generally at or below the plane of said horizontal surface, said assembly comprising a mounting rail adapted to be attached to the edge of an element below the horizontal surface thereof, a top rail parallel to said mounting rail, support bars pivotably connected to said mounting rail and to said top rail in spaced, parallel position to permit said top rail to be pivoted between upright position in which it is spaced above said mounting rail and folded position in which it is in contact with said mounting rail, said mounting rail comprising a channel member which is open on the top side thereof and within which the support bars are pivotably attached and within which portions of the support bars are received when said assembly is pivoted to folded position, each of said support bars being pivotably attached to said mounting rail by means of a vertical pin on said rail which is engaged within a longitudinal slot in said support bar spaced from the base thereof, to permit said support bars to be moved in a direction perpendicular to said mounting rail, when said assembly is in upright position, between resting position, in which the base of each said support bar engages a retaining means present on the mounting rail, below the point of pivotal attachment between said bar and said rail, to prevent pivotal movement of each said support bar, and lift position in which the base of each said support bar is free of engagement with the said retaining means and the assembly can be pivoted to folded position, said retaining means for each support bar comprising and opening on the bottom side or floor of the channel mounting rail adapted to receive the base of the support bar, when the support bar is in resting position, and to prevent pivotal movement of the support bar in said position.

4,217,671

MULTIPURPOSE CLEANING DEVICE

Bobby J. Rand, 3401 Dogwood Dr., Raleigh, N.C. 27604

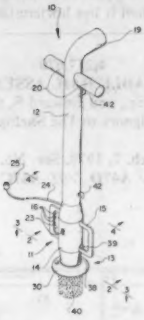
Filed Jan. 25, 1979, Ser. No. 6,469

Int. Cl.[2] A46B *13/04*

U.S. Cl. 15—24 **7 Claims**

1. An improved cleaning means comprising: a motor por-

tion; an elongated handle portion removably secured to said motor portion; at least one outwardly disposed side handle means secured to said motor portion; a scrubber head operatively attached to said motor portion opposite said elongated handle connection and adapted to be driven by a motor within said housing; a material dispersing means operatively disposed



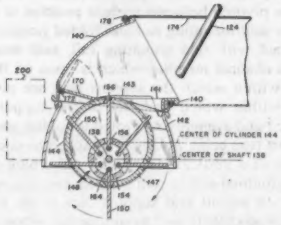
between said motor portion and said scrubber head, said dispersing means being in the form of a generally circular housing having a plurality of normally closed dispersing openings disposed in a generally circular pattern provided therein whereby an improved cleaning means which can be operated both remotely from the scrubber head and in restricted areas is provided.

4,217,672

DEBRIS PICKER AND BAGGER

Humbert Olivari, 7200 Shady Villa La., Apt. 129, Houston, Tex. 77055

Filed Aug. 28, 1978, Ser. No. 937,302
Int. Cl.[2] E01H *1/04*; A01G *1/12*
U.S. Cl. 15—79 A **11 Claims**



1. A device for collecting debris from the ground and depositing said debris in a disposable container, comprising:

support wheels, said support wheels being spaced apart, and mounted on axle means;

a housing means, said housing means being located between and connected to said support wheels;

a handle means, said handle means being for manually pushing said device, said handle means attached to the combination of said support wheels and said housing means;

a cylindrical drum means, said drum means having spaced slots therein, said slots being located in the wall of said cylindrical drum means;

a straight shaft means;

a plurality of spaced debris raking means, said debris raking means being pivotally mounted on said shaft means, said pivotally mounted debris raking means providing a flexible movement to said debris raking means, said shaft means being located within and attached to said cylindrical drum means, the ends of said plurality of spaced debris raking means extending through said spaced slots, each said debris raking means having a designated slot through which it extends, the longitudinal center line of said drum means being located eccentrically in relation to the longitudinal center line of said shaft means of said debris raking means, said cylindrical drum means with said debris raking means and shaft means therein mounted within and remotely connected to said housing means;

means for transmitting motion to said debris raking means and said cylindrical drum means; and

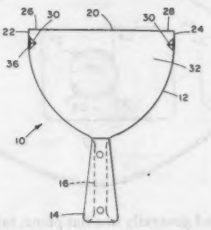
a disposable container means, said disposable container means for receiving and holding said debris, said disposable container means being removably connected to said housing means and communicating therewith, said housing means serving as a chute means to direct said debris into said disposable container means.

4,217,673

BROAD KNIFE FOR DRYWALL CORNERS

Robert J. Pearson, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Jan. 22, 1979, Ser. No. 5,485
Int. Cl.[3] B05C *17/10*
U.S. Cl. 15—235.7 **4 Claims**



1. An improved broad knife for applying joint compound to drywall inside corners comprising a thin flat semi-rigid broad metal blade, a straight forward thin edge on the forward end of said broad knife blade having a length of about 3 to 6 inches, handle means at the rearward end of said blade, thin side edges on said blade extending rearwardly from each end of said forward edge at substantially a 90° angle and a small protuberance near at least one corner of said side edge and said forward edge on one face of said blade, said protuberance having a relatively smooth face on the side toward the adjacent side edge, extending along only a minor portion of the side edge and suitable for riding along the surface of a layer of joint compound adjacent a drywall corner.

4,217,674

UPRIGHT VACUUM CLEANER

Seizo Hayashi, Yohkaichi; Shinya Tsutsumi, Ohmi-hachiman, and Yoshihiro Kuroki, Yohkaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

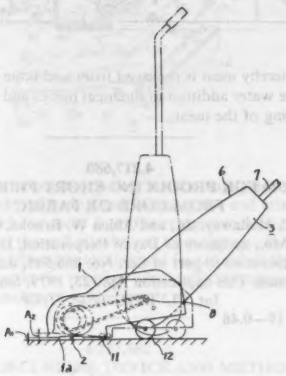
Filed Dec. 1, 1978, Ser. No. 965,495
Claims priority, application Japan, Dec. 6, 1977, 52-146744
Int. Cl.[2] A47L *5/34*
U.S. Cl. 15—361 **10 Claims**

1. A vacuum cleaner including a main body having a suction opening in the lower surface of one end thereof, and a handle body including a lower end portion pivoted to the main body on a horizontal axis adjacent to the other end thereof, the handle body being movable about said axis between an upright storage position and an inclined operating position, wherein the improvement comprises:

contact portions carried by the main body, said contact portions being positioned between the suction opening and the pivotal axis of the handle body and being adapted

for contact with a floor surface, the main body being rockable on the contact portions to vary the distance between the suction opening and the floor surface;

and supporting wheels rotatably mounted on the lower end portion of the handle body in radially spaced relation to the pivotal axis of the handle body, said wheels being movable with the handle body and being arranged to rock



the main body on the contact portions and increase the distance between the suction opening and the floor surface in response to movement of the handle body to said upright storage position whereby the suction opening is moved away from the floor surface when the handle body is in said upright storage position and is moved toward the floor surface when the handle body is in said inclined operating position.

4,217,675

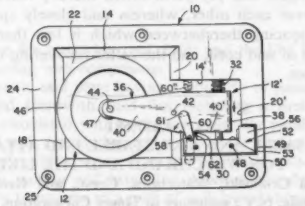
RETRACTABLE WHEEL ASSEMBLY FOR LUGGAGE

Theodore Haft, 3844 Carrel Blvd., Oceanside, N.Y. 11572

Filed Jun. 22, 1979, Ser. No. 50,968

Int. Cl.³ B60B *33/04*

U.S. Cl. 16—19 **10 Claims**



1. A retractable wheel assembly for an article of luggage or the like, comprising:

a housing attachable to said article of luggage and having walls defining a well, closed top and open bottom;

a wheel support having a pair of spaced flat legs;

a wheel rotatably mounted on its axis between said legs;

shaft means in said well rotatably carrying said wheel support, said wheel support being freely movable laterally on said shaft means;

bracket means carried by said housing and arranged to engage said wheel support when in outwardly extending position; and

spring means in said well arranged to urge said wheel support into engagement by said bracket means when in outwardly extended position, whereby said wheel support can be disengaged from said bracket means by moving said wheel support laterally on said shaft means against bias in said spring means, and whereby said wheel support can be rotated into said well when disengaged from said bracket means.

4,217,676

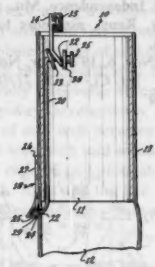
PLEAT FILLER AND DRAPERY HANGER COMBINATION

Thelma L. Terrones, P.O. Box 674, Pine Valley, Calif. 92062

Continuation-in-part of Ser. No. 806,762, Jun. 15, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,586

Int. Cl.² E05D *13/02;* **A47H** *13/04, 15/00*

U.S. Cl. 16—87.2 **9 Claims**



1. A drapery hanger device comprising:

a generally U-shaped member having a pair of upwardly extending legs connected together at their bottoms by a cross member, one of said legs being a drapery attaching leg and the other leg being a middle body leg:

a curtain rod lug attaching member formed at the top end of said middle body leg: and

means on said curtain rod lug attaching member for varying the angle that said drapery attaching leg makes with a horizontal plane when said drapery hanger device is attached to the curtain rod lug of a curtain rod, said means comprising said curtain rod lug attaching member having a disc on it, said disc being spaced inwardly from the free end of said curtain rod lug attaching member, said disc functioning as a shoulder against which one face of a curtain rod lug is captured.

4,217,677

APPARATUS FOR PREVENTING TRANSMISSION OF VIBRATION OF A VIBRATION MACHINE

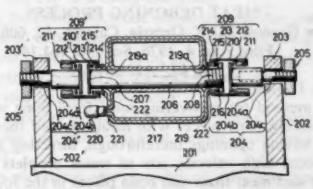
Satoshi Sumikawa, Hiroshima, Japan, assignor to Kure Tekko Company Ltd., Japan

Filed Nov. 13, 1978, Ser. No. 959,923

Claims priority, application Japan, Mar. 13, 1978, 53-32414[U]; May 8, 1978, 53-62016[U]

Int. Cl.² B25G *1/02*

U.S. Cl. 16—119 **6 Claims**



1. In an apparatus for preventing transmission of vibration of a vibration machine, the improvement comprising a grip member of the vibration machine being constructed by a handle

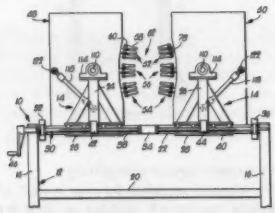
base portion, an air bag fitted around the outer circumference of the handle base portion, an air layer surrounding the handle base portion inside the air bag, the air bag being fitted to the handle base portion by fitting an outer cylinder to the handle base portion, the outer cylinder being secured to the handle base portion by locking means, a cylinder cover comprising inextensive flexible material loosely fitted to the outer circumference of the outer cylinder, and a plurality of air bags made of expandable material disposed in the gap between the outer cylinder and the cover, the air bags having an arcuate sectional shape and being disposed adjacent to each other in the circumferential direction of the outer cylinder.

4,217,678

POULTRY PICKING MACHINE

David R. Crawford, Independence, Mo., and David M. McDonald, Kansas City, Kans., assignors to Simon-Johnson Inc., Kansas City, Mo.

Filed Nov. 6, 1978, Ser. No. 958,249
Int. Cl.[2] A22C *21/02*
U.S. Cl. 17—11.1 R **11 Claims**



1. A machine for picking the feathers from poultry carcasses advanced in succession along a predetermined path of travel, said machine comprising:

a frame;

two banks of pickers carried by said frame for disposition on opposite lateral sides of said path of travel,

each bank including a normally upper line of several individual pickers extending along said path of travel in spaced opposition to a corresponding upper line of several individual pickers on the other bank,

each bank further including a normally lower line of several individual pickers extending along said path of travel in spaced opposition to a corresponding lower line of several individual pickers on the other bank;

means mounting said banks on the frame for rocking movement about respective ones of a pair of horizontal axes extending along said path of travel; and

selectively operable adjuster mechanism between said frame and the banks for effecting said rocking movement of the banks to thereby adjust the shape of the picking zone defined between the opposed lines of pickers by adjusting all individual pickers of each bank simultaneously.

4,217,679

MEAT DEBONING PROCESS

Matthew Gordon, 333 E. Ontario, Chicago, Ill. 60611

Filed Aug. 4, 1978, Ser. No. 931,140
Int. Cl.[3] A22C *17/04*
U.S. Cl. 17—46 **7 Claims**

1. A method for recovering meat from bone which comprises placing bone pieces with meat adhered thereto onto a surface having openings therethrough, directing against said bone pieces high velocity jets of water droplets and air to separate said meat from said bone pieces in the form of small meat pieces, all of said water droplets being in the liquid phase, permitting said small meat pieces to fall through said openings while retaining said bone pieces on said surface, said water being directed toward said surface at a pressure from about 20 to 100 pounds per square inch and said air being supplied at a pressure from about 2000 to about 8000 pounds per square

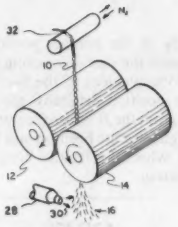
inch, whereby meat is removed from said bone pieces without excessive water addition to the meat pieces and without excessive drying of the meat.

4,217,680

METHOD FOR PRODUCING SHORT FIBER LENGTHS FROM CORD OR FABRIC

Gerald C. Hollaway, Jr., and Alden W. Brooks, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 866,588, Jan. 3, 1978, abandoned. This application Apr. 23, 1979, Ser. No. 32,576
Int. Cl.[3] D01G *1/02, 11/04*
U.S. Cl. 19—0.46 **32 Claims**



1. A method for producing short fiber lengths from a cord comprising at least two ply yarns which comprises continuously passing said cord between closely spaced means for applying point contact compressive force to said cord at the points where said ply yarns cross, thereby making said ply yarns sever each other, wherein said closely spaced means have a spacing therebetween which is less than the major diameter of said cord, and thereafter recovering the resulting short fiber.

4,217,681

RELEASABLE AND ADJUSTABLE END ATTACHMENT FOR WATCHBAND AND THE LIKE

Raymond Grohoski, Watertown, Conn., and George Mileos, Riverdale, N.Y., assignors to Timex Corporation, Waterbury, Conn.

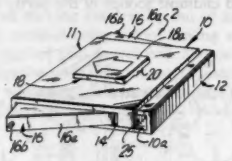
Filed Dec. 26, 1978, Ser. No. 973,220
Int. Cl.[2] A44C *5/18*
U.S. Cl. 24—265 WS **25 Claims**

1. An end attachment for watch bands to be releasably and adjustably mounted between the spaced lugs of a watch, comprising,

(a) a housing having a first end portion adapted to fit between the spaced lugs and a second end portion adapted for connection to the watch band, said housing having side apertures one of which faces one lug and the other of which faces the other lug;

(b) a pair of spaced, non-intersecting levers pivotably mounted in the housing, each lever having a lug-engaging portion disposed in the first end portion of the housing adjacent one of said side apertures;

(c) a sliding member disposed in the housing between the spaced levers with a portion thereof accessible from outside the housing for manual translation of said member between said levers along the length thereof to cause via a camming action against the levers the lug-engaging portions thereof to pivot through the side apertures



toward the respective facing lug for engagement therewith, thereby adjusting and fastening the end attachment to the watch, or away from the respective facing lug for disengaging the end attachment from the watch; and

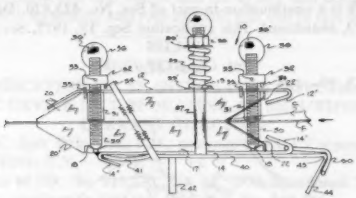
(d) means for releasably locking said levers and sliding member together in the position which effects engagement of the end attachment to the watch.

4,217,682

WEB EDGE DECURLING DEVICE AND METHOD FOR USING SAME

William O. Young, Jr., 116 Marlin Dr., Spartanburg, S.C. 29302, and Mansel A. Jennings, Rte. 3, Box 349, Inman, S.C. 29349

Continuation of Ser. No. 675,305, Apr. 9, 1976, abandoned. This application Nov. 28, 1977, Ser. No. 855,373
Int. Cl.[2] D06C *25/00*
U.S. Cl. 26—98 **18 Claims**



1. A device for removing curl, folds and the like from an edge of a moving web comprising:

(a) a top plate, said plate having a plurality of parallel fins associated therewith, said fins including a first flange section associated with said plate generally parallel to a path of web travel through said device and a second elongated section secured to and angularly offset from said first section and extending downwardly therefrom generally transverse to a path of web travel through said device, an outer free edge of said second elongated section of said fins having a smooth angled surface for contact with said web;

(b) a bottom plate, said bottom plate having a plurality of parallel fins associated therewith, said fins having a first flange section associated with said plate generally parallel to a path of web travel through said device and a second elongated section secured to and angularly offset from said first section and extending upwardly therefrom generally transverse to said path of web travel, an outer free edge of said second elongated section of said fins having a smooth angled surface for contact with said web; and fins being located immediately adjacent and offset from the vertical planes of said fins associated with said top plate whereby said outer free edges of said elongated second sections of said top and bottom fins define said web passageway therebetween, said top and bottom fins being disposed at an angle to an edge of a web traveling thereby; and

(c) adjustment means associated with said plates to set said fins at a predetermined relationship.

16. A method for removing curl, folds and the like from a traveling web of knit material comprising the steps of:

(a) providing a pair of opposite banks of elongated static fins, one bank being above said web and the other bank below said web, said fins of each bank being parallel and angularly presented with respect to a path of web travel, said fins including a first flange section that extends generally parallel to said path of web travel and a second elongated section that is angularly offset from said first section and extends generally transverse to said path of web travel, said generally transverse elongated fin section having a smooth angled surface along an outer free edge of same for contacting said web, said fins of one bank being offset from the vertical planes of fins of said other bank and said banks of fins being preadjusted such that the outer free ends of said generally transverse elongated sections provide a web passageway therebetween; and

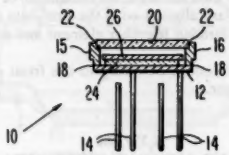
(b) passing an edge of said web between said banks of fins and engaging said web with said smooth angled surfaces of said outer free ends of said elongated sections of said fins, whereby curls, folds and the like are removed from said web without creating any substantial longitudinal web tensions.

4,217,683

METHOD FOR RESISTANCE WELDING OF AN ELECTRO-OPTIC DEVICE HOUSING

Rene E. Cardinal, Montreal, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,909
Claims priority, application Canada, Oct. 23, 1978, 313897
Int. Cl.[2] H01J *9/24*
U.S. Cl. 29—25.13 **2 Claims**



1. A method for resistance welding a cap, having a wall and a window mounted therein with a heat sensitive glass-to-metal seal, to a header to form a housing which consists essentially of,

mounting said cap in a collet electrode;

tightening the collet electrode about said cap for compressing the wall of said cap sufficient to maintain said glass-to-metal seal under compression and for providing thermal and electrical contact to the wall of said cap;

mounting said header on said cap;

mounting a second electrode on the perimeter of said header for forcing said header against an end of the wall of said cap; and

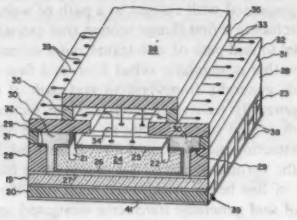
passing an electrical energy pulse of sufficient magnitude between the collet electrode and the second electrode through said header and the wall of said cap so as to weld said cap and said header together whereby said heat sensitive glass-to-metal seal is not disturbed.

4,217,684

FABRICATION OF FRONT SURFACE MATCHED ULTRASONIC TRANSDUCER ARRAY

Axel F. Brisken, Ballston Lake, and Lowell S. Smith, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 16, 1979, Ser. No. 30,299
Int. Cl.[2] H01L *41/22*
U.S. Cl. 29—25.35 **12 Claims**



1. The method of assembling a front surface matched ultrasonic transducer array operative to generate ultrasound pulses at an emission frequency and to detect echoes comprising the steps of:

plating with metal at least the major surfaces and two side edges of a rectangular slab of piezoelectric ceramic having a thickness of one-half wavelength at the emission frequency, and bonding to the plated ceramic at least one impedance matching layer having a thickness of one-quarter wavelength at the emission frequency,

cutting slots in the plated ceramic near the side edges such that the distance between slots is equal to a designated element radiative length,

making first cuts parallel to the end edges of the plated ceramic at a spacing equal to a designated element width and which extend completely through the ceramic and partially into the matching layer to thereby delineate an array of elements each having a signal electrode and a wrap-around ground electrode,

fabricating a flying lead connection to the signal electrode of every element and a common connection to the ground electrodes,

making second cuts through the remainder of the matching layer which are aligned with the first cuts to completely separate the bonded together element and matching layer units, and

attaching a continuous covering to the front surface of the matching layer.

4,217,685

METHOD OF AND APPARATUS FOR ATTACHING TOP STOPS TO A SLIDE FASTENER CHAIN

Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 20, 1978, Ser. No. 962,177
Claims priority, application Japan, Nov. 25, 1977, 52-141169
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—408 **16 Claims**

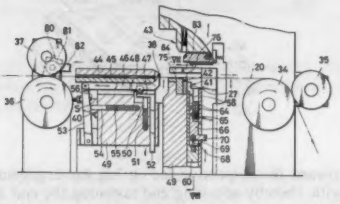
1. A method of attaching top stops to a slide fastener chain including a pair of continuous stringers, each stringer having successive spaced groups of scoops mounted on a continuous stringer tape and interengaged with opposed complementary groups of scoops on the other stringer tape, which method comprises:

(a) feeding the fastener chain longitudinally along a predetermined path;

(b) causing a displaceable actuating pawl to be engaged by one of the successive spaced pairs of scoop groups of the fastener chain so as to be displaced therewith along the path;

(c) causing a separator to spread one of the successive pairs of opposed blank tape spaces of the fastener chain in response to a signal generated upon displacement of the actuating pawl over a predetermined distance with the fastener chain, the pair of blank tape spaces being spread to such an extent that end portions of an adjacent pair of scoop groups are disengaged from each other;

(d) further moving the fastener chain along the path until the disengaged endmost scoops of the partly disengaged pair



of scoop groups come into abutment against stop means disposed adjacent to a die, whereby the disengaged end portions of the partly disengaged pair of scoop groups are positioned upon the die;

(e) attaching top stops to the disengaged end portions of the partly disengaged pair of scoop groups by punch means coacting with the die; and

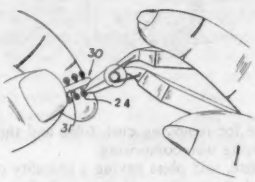
(f) repeating the foregoing steps to apply top stops to the end portions of the successive spaced pairs of scoop groups.

4,217,686

ORTHODONTIC O-RING AND LIGATOR THEREFORE

William B. Dragan, R.F.D. #1 Burr St., Fairfield, Conn. 06430

Division of Ser. No. 631,920, Nov. 14, 1975, Pat. No. 4,106,374, which is a continuation-in-part of Ser. No. 423,420, Dec. 10, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,180
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—413 **7 Claims**



7. A method of dispensing dental O-rings comprising the steps of: forming a core member of an elastic material so as to define an elongated central core, having spaced therealong, a plurality of branches, and forming an O-ring at the end of each of said branches of the same elastic material as the material of the core and connected branches, forming each of said branches with a frangible portion, and effecting the separation of the O-ring from its associated branch at the formation of the frangible portion by distorting the O-ring to a flat oval.

4,217,687

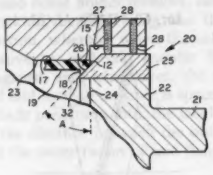
METHOD AND APPARATUS FOR MAKING BACKOUT STOP FOR CAULKER CARTRIDGE

Phillip L. Miller, Dundee, and Dick T. vanManen, Canandaigua, both of N.Y., assignors to Voplex Corporation, Fairport, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,114
Int. Cl.[2] B23P *25/00*
U.S. Cl. 29—527.2 **11 Claims**

1. A method for making a backout stop for a caulker car-

tridge having a cylindrical barrel of resin material, said backout stop being formed at the rear end of said barrel as a radially inwardly oriented hook that is generally triangular in cross section with an inclined surface sloping radially inward from the region of the outer surface of said barrel for allowing a plunger to be moved over said backout stop into said rear end of said barrel, said hook also having an abrupt edge extending inward from the inside surface of said barrel and preventing said plunger from moving rearwardly out of said rear end of said barrel, said method using a tool having a socket fitting over said rear end of said barrel and a resin-forming edge protruding obliquely into said socket to extend along said inclined surface when said tool is seated on said rear end of said barrel, and said method comprising:



a. supporting said barrel and said tool on a common axis with said socket of said tool confronting said rear end of said barrel;

b. moving one or the other of said barrel and said tool axially to press said tool and said rear end of said barrel together in seated engagement wherein said edge is pressed into said resin material at said rear end of said barrel;

c. rotating one or the other of said barrel and said tool while said tool and said barrel are pressed together so said edge plows along said inclined surface and forms said resin material at said rear end of said barrel into said hook; and

d. axially separating said tool and said rear end of said barrel.

4,217,688

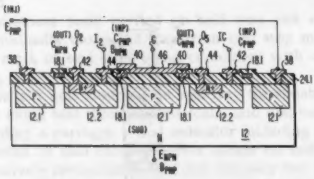
FABRICATION OF AN INTEGRATED INJECTION LOGIC DEVICE INCORPORATING AN MOS/BIPOLAR CURRENT INJECTOR

Alfred C. Ipri, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 914,870, Jun. 12, 1978, abandoned. This application Dec. 14, 1978, Ser. No. 969,486

Int. Cl.³ B01J *17/00*

U.S. Cl. 29—571 **1 Claim**



1. A method of fabricating an Integrated Injection Logic device having a lateral transistor with a narrow base width region and a vertical NPN transistor, comprising the steps of:

providing a semiconductor body of a given conductivity type, the body having a common boundary surface;

depositing a layer of oxide on the common boundary surface;

depositing a layer of polycrystalline silicon on the oxide layer;

depositing a layer of apertured masking material on the polycrystalline silicon layer;

etching the unmasked portions of the polycrystalline silicon layer to expose unetched edges of polycrystalline silicon under the masking layer;

doping the exposed edges of the unetched polycrystalline silicon layer to form a narrow line of doped polycrystalline silicon in the polycrystalline silicon layer, the narrow doped line defining the limits of the width of the base region of the lateral transistor;

modifying areas of the semiconductor body to an opposite conductivity type to form emitter and collector regions of the lateral transistor; the collector region of the lateral transistor also functioning as the base region of the NPN transistor

depositing a layer of apertured masking material on the layer of oxide, the exposed portions thereof aligned with portions of the collector region of the lateral transistor;

modifying the exposed portion of the collector region of the lateral transistor to the given conductivity type to form the collector region of the NPN transistor, the remaining portion of the body of semiconductor material being common to the base region of the lateral transistor and the emitter region of the NPN transistor;

providing each region with a respective ohmic contact; and

providing an ohmic contact to the narrow doped polycrystalline silicon line defining the limits of the width of the base region of the lateral transistor.

4,217,689

PROCESS FOR PREPARING SEMICONDUCTOR DEVICES

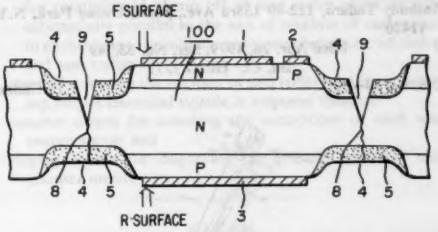
Toshiyuki Fujii; Kiyohiko Mihara; Shigeru Hokuyo, and Yoshio Ishibashi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,347

Claims priority, application Japan, Sep. 14, 1976, 51/110582; Sep. 16, 1976, 51/111501; Nov. 16, 1976, 51/138211; Nov. 16, 1976, 51/138212; Jan. 8, 1977, 52/000988

Int. Cl.² H01L *21/304*

U.S. Cl. 29—583 **14 Claims**



1. A process for producing a plurality of identical semiconductor devices from a single piece of semiconductor material, having a semiconductor substrate, comprising the steps of:

forming an insulation coating upon at least one of the upper and lower surfaces of the semiconductor substrate said coating being subject to cracking when shaved by a high speed rotating diamond blade having substantially parallel side surfaces:

utilizing a high speed rotating diamond blade having a tapered edge constructed to eliminate cracking of the coating to form a plurality of shaved grooves through the insulation coating and into the semiconductor substrate; and

breaking the semiconductor substrate along the shaved grooves to form a plurality of identical semiconductors;

whereby the taper of the blade permits the coating to be shaved to define individual semiconductors without being cracked or chipped.

4,217,690

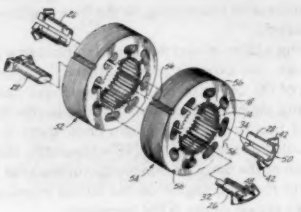
METHOD OF ASSEMBLY FOR ELECTRIC MOTOR STATORS

Anthony P. Morreale, Whittier, Calif., assignor to Rapidsyn Co., Santa Fe, Calif.

Continuation-in-part of Ser. No. 918,395, Jun. 23, 1978, abandoned. This application Sep. 11, 1978, Ser. No. 941,026

Int. Cl.[2] H02K *15/02, 15/10*

U.S. Cl. 29—596 4 Claims



1. A method of assembling a motor stator from a plurality of stamped sheet metal laminations having an outer circular rim and an even number of inwardly projecting poles separated by undercut slots joined by means of molded slotted tubular male and female insulator elements flanged at one end and having telescoping ends at the other end, comprising the steps of: forming two stacks of laminations, inserting the female insulator elements into alternate slots in each of the stacks, joining the two stacks together with the female insulator elements of one stack being inserted into the open slots of the other stack, and inserting male insulator elements from the opposite end of each of the slots from the female insulator members into telescoping engagement with the inserted ends of the female insulator elements.

4,217,691

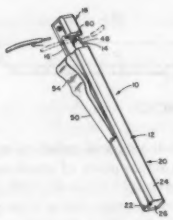
AUTOMATIC WIRE STRIPPER

Anthony Todaro, 122-40 133rd Ave., South Ozone Park, N.Y. 11420

Filed Apr. 26, 1979, Ser. No. 33,749

Int. Cl.[3] H02G *1/12*

U.S. Cl. 30—90.1 12 Claims



1. A wire stripper comprising:

An elongated housing, a notched section formed in said housing which divides said housing into a forward head portion and a rearward body portion;

a fixed blade securely retained into said head portion and extending partway into said notched section;

a hollow chamber formed in said body portion, an elongated opening formed in said body portion in communication with said hollow chamber;

an actuating lever positioned in said elongated opening and extending into said chamber;

a leaf spring in said chamber retained by said actuating lever and longitudinally movable by means of said lever between a forward and rearward position; and

a movable blade supported by the forward end of the leaf spring and longitudinally extending into the notched section in opposition to said fixed blade and cooperatively defining therewith a wire receiving and stripping throat.

4,217,692

GARDENING SHEARS

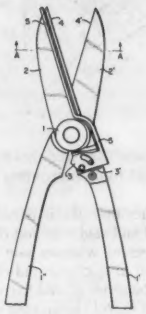
Kimikazu Ishida, 7-15, Fukui 3-chome, Miki City, Hyogo Prefecture, and Tsuneo Ishida, 1270-72, Shukuhara, Miki City, Hyogo Prefecture, both of Japan

Filed Dec. 22, 1978, Ser. No. 972,258

Claims priority, application Japan, Dec. 27, 1977, 52-176479[U]

Int. Cl.[2] B26B *13/22*

U.S. Cl. 30—128 5 Claims



1. Gardening shears comprising a shears body, holding members, cutting blades having cutting lines, a driving means disposed on said shears body, a repelling member adjacent to the said cutting lines on said cutting blades.

4,217,693

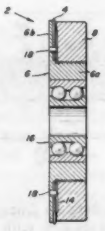
CONTROLLED DEPTH SCORING TOOL

Hugh H. Roder, Bridgeton, and James P. Baum, St. Charles, both of Mo., assignors to Boise Cascade Corporation, Boise, Id.

Filed Apr. 11, 1979, Ser. No. 29,155

Int. Cl.[3] B26B *25/00;* B26D *3/08*

U.S. Cl. 30—292 5 Claims



1. A scoring tool for forming in a composite container label layer a scoreline having a controlled predetermined depth, comprising

(a) an annular scoring blade;

(b) means supporting said blade for rotation about a given axis, said blade supporting means including

(1) an annular blade holder member including at one end an annular portion upon which said blade is mounted,

the outer diameter of said annular portion corresponding with the inner diameter of said scoring blade, said blade holder member including at its other end an annular flange portion the outer diameter of which is less than that of said blade member, the outer peripheral surface of said annular flange portion being adapted to abut against the composite container label layer during the scoring operation; and

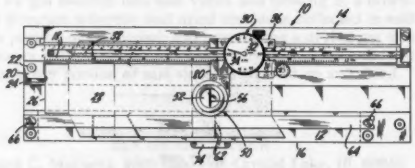
(2) means retaining said scoring blade in contiguous engagement with said flange portion, said retaining means including an annular locking member mounted concentrically about said holder member annular portion in contiguous engagement with a portion of said scoring blade adjacent the outer circumferential cutting portion of said blade, and means connecting said locking member with said blade holder member, the outer diameter of said locking member being less than that of said flange portion, whereby when the scoring tool is rotated relative to, and said annular flange portion is pressed against, said label layer, the outer peripheral surface of said locking member is spaced from, and said scoring blade penetrates into, the label layer to a depth equal to the distance between the outer radius of said blade and the outer radius of said flange portion.

4,217,694

APPARATUS AND METHOD FOR CHECKING SCORE LINES IN FLAT PACKAGE BLANKS

James A. Bowling, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,330
Int. Cl.³ G01B *5/02*
U.S. Cl. 33—125 A **6 Claims**



1. Apparatus for checking the location of a cut or score line in a flat package blank relative to a datum edge of said blank, said apparatus comprising

a tray for holding the blank to be checked;

stop means carried on said tray and constituting an abutment against which the datum edge of said blank can be engaged;

a measurement scale carried on said tray and extending longitudinally along the tray from said stop means, the zero mark of said scale being coincident with said abutment;

a dial caliper unit mounted on said tray for slidable movement along said measurement scale, said dial caliper unit including a carriage, a dial indicator including a pointer mounted on said carriage, drive means on said carriage operatively connected to said dial indicator and rotatively engaged with said measurement scale for rotating the pointer of said dial indicator when said carriage is slid along said measurement scale, said carriage having a reference surface which can be brought into engagement with said abutment by sliding said carriage against said stop means, the pointer on said dial indicator being positioned at a zero reading when said reference surface is engaging said abutment, the measurement scale being graduated in major increments of length, the dial indicator being graduated to denote subdivision of one major increment for each complete revolution of said pointer; and

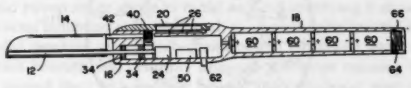
magnification reading means mounted on said carriage and embodying a hairline member aligned with the reference surface on said carriage, said carriage being slid to position said hairline member in registry with a cut or score line on said package blank, the location of said carriage reference point relative to a major increment of length on said measurement scale and the position of the pointer on said dial indicator denoting the distance measure of said cut or score line from the datum edge of said blank said apparatus further including a carrier member fixed to said carriage and movable therewith at the underside of said package blank, a permanent magnet fixed to said carrier member, and a wire of ferrous material receivable on top of said package blank, said magnet attracting said wire to move it along said blank and position it in said cut or score line.

4,217,695

HAIR LENGTH MEASURING APPARATUS

Bruce H. Chapman, 6444 Garrone Ave., Newark, Calif. 94560; James E. Oliver, 475 Magnolia, Half Moon Bay, Calif. 94019, and Lawrence L. Talarico, 1013 Via Palma, San Lorenzo, Calif. 94580

Filed Jul. 17, 1978, Ser. No. 925,303
Int. Cl.² G01B *7/02, 3/12*
U.S. Cl. 33—134 R **9 Claims**



1. A hair length measuring apparatus comprising:

a body portion including a handle defined at one end thereof;

a measuring roller operatively attached to said body portion;

a holding clamp operatively attached to said body portion such that said clamp is adjacent to said roller;

means for removably biasing said clamp against said roller for holding hair positioned between said clamp and said roller against said roller, such that said roller is caused to rotate when said roller and holding clamp are moved along the length of said hair, said means comprising means for rotating said clamp off of said roller about an axis substantially parallel to the axis of rotation of said roller, to enable hair to be initially positioned between said clamp and said roller;

means for sensing the rotation of said roller, and for generating output electrical signals in response thereto;

counter means for counting the occurrence of each said output signal; and

display means for displaying the present count of said counter means.

4,217,696

TIME-DISTANCE CALCULATOR

John R. Schindler, P.O. Box 5171, Klamath Falls, Oreg. 97601

Filed May 14, 1979, Ser. No. 38,665
Int. Cl.² G01B *3/12*
U.S. Cl. 33—141 C **3 Claims**

1. Measuring and calculating apparatus comprising

an elongate body defining a track along a portion of its length,

a traction element rotatably mounted at one end of said body, adapted to be moved across a surface with the element in engagement therewith,

an indicator movable along said track,

means operatively connecting said traction element and said

indicator to move the indicator along said track in response to rotation of the traction element as the latter is moved across a surface,

a substantially transparent, elongate sleeve member mounted on said body over said portion for rotation thereabout, and

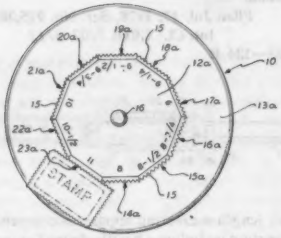
means defining radial and axial calibrations on said sleeve, with rotation of said sleeve being performable to align selected radial and axial calibrations with said track and said indicator, respectively.

4,217,697

STAMP GAUGE

Henry G. Schneider, 81 Passaic Valley Rd., Montville, N.J. 07045

Filed Jan. 2, 1979, Ser. No. 962,391
Int. Cl.[2] G01B 5/00
U.S. Cl. 33—174 K 5 Claims



1. A stamp gauge comprising a disk-shaped member having a raised hub and a surrounding disk providing a guide surface leading to the edge of the hub, wherein said edge is shaped to have a series of chord lines serrated by different numbers of serrations per unit length to form a series of different gauge edges about the hub whereby to enable a determination of the numbers of serrations per unit length in the edge of a stamp by slidably moving the stamp on said guide surface selectively into contact with said gauge edges until an exact engagement is obtained, and wherein the number of serrations per unit length for each gauge edge is imprinted in the hub at the respective gauge edge.

4,217,698

METHOD OF AND APPARATUS FOR MEASURING THE AXIAL DISPLACEMENT (LATERAL) OF A TAPERED ROLLER BEARING ASSEMBLY FOR USE IN RAILROAD ROLLING STOCK

Robert J. Van Sickle, Richmond, Va., assignor to Rail Bearing Service, Richmond, Va.

Filed Mar. 15, 1979, Ser. No. 20,746
Int. Cl.[2] G01B 5/00
U.S. Cl. 33—174 R 19 Claims

1. A method of measuring the axial displacement (lateral) of a tapered roller bearing assembly on a lateral station machine which comprises the steps of

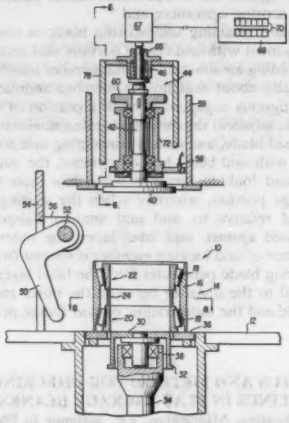
a. centering a tapered roller bearing assembly on a work surface with respect to a vertical axis of said machine and with said tapered roller bearing assembly including a cylindrical cup having internal raceways which receive a lower cone assembly, an upper cone assembly and a cylindrical spacer between the upper and lower cone assemblies,

b. inserting a mandrel into the lower cone assembly with said mandrel having flange means engageable with said lower cone assembly in order to lift said lower cone assembly,

c. lifting said lower cone assembly with said mandrel thereby force loading said lower cone assembly in its raceway within said cup and thereby lifting the entire tapered roller bearing assembly,

d. supporting said cup in raised position,

e. force loading said upper cone assembly while releasing the force loading on said lower cone assembly, and



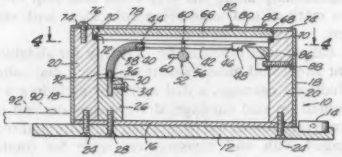
f. measuring the lateral movement for said roller bearing assembly in moving from one force loading position to the other force loading position.

4,217,699

TERRESTRIAL MAGNETISM RESPONSIVE DEVICE AND METHOD FOR USING NORTH OR SOUTH SEEKING MAGNETS IN BOTH NORTH AND SOUTH HEADINGS

Raymond F. Stockton, 1780 Foothill Dr., Vista, Calif. 92083

Filed Aug. 31, 1977, Ser. No. 829,265
Int. Cl.[2] G01C 17/08; G01V 3/08
U.S. Cl. 33—355 R 9 Claims



1. A terrestrial magnetism responsive device adapted to use a north or south seeking magnet in both north and south headings, comprising:

a housing having a pole seeking magnet thereon,

said magnet being suspended to be movable horizontally,

said magnet being suspended on a sensitive spring adajcent a non-seeking pole, said spring being supported in said housing,

said spring being a coil supported vertically at a lower end, said magnet being attached to the other end of said spring so as to extend substantially horizontally therefrom.

4,217,700

PROCESS FOR DRYING FILTRATION RESIDUE

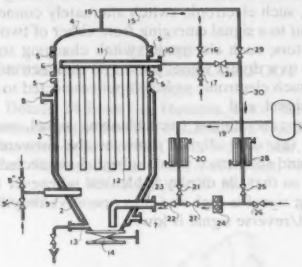
Hans Müller, Erlenbach, Switzerland, assignor to Chemap AG, Maennedorf, Switzerland

Filed Dec. 4, 1978, Ser. No. 965,914

Claims priority, application Switzerland, Dec. 16, 1977, 15500/77

Int. Cl.³ F26B *7/00*

U.S. Cl. 34—19 **8 Claims**



1. A process for drying wet filter residue in a filter comprising a filtration vessel, at least one vertical filter element which receives said residue during filtration, an inlet and an outlet for a substance to be filtered and a duct in a lower portion of said filtration vessel to introduce a drying gas into said filtration vessel, the process including: passing the drying gas introduced into said vessel after the filtration is completed through said filter element in a direction of filtration to dry said residue, mechanically removing said dried residue from said filter element by gas inserted into said vessel and flowing in a downward direction whereby said dried residue is collected in said lower portion of said vessel; and introducing a drying gas into said lower portion of said vessel whereby the residue collected in said lower portion of said vessel is whirled up and dried.

4,217,701

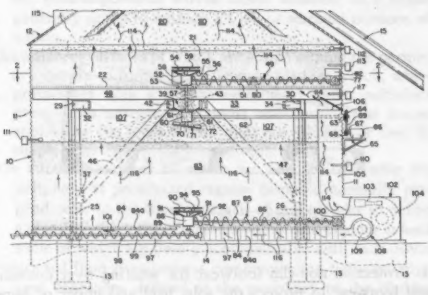
BIN GRAIN DRYER

Bernard C. Mathews, 8606 Rte. 176, Crystal Lake, Ill. 60014

Filed Apr. 23, 1979, Ser. No. 32,714

Int. Cl.² F26B *25/06*

U.S. Cl. 34—211 **4 Claims**



1. A cylindrical storage and drying bin for granular material comprising a cylindrical wall, a generally conical shaped top covering said cylindrical wall, an inlet opening located in the conical shaped top covering at the apex thereof, said inlet opening adapted to receive grain to be dried, a first spreader means located immediately beneath said inlet opening for spreading said grain over the full circular area defined by the cylindrical wall, a first upper perforated floor horizontally disposed in said bin, said first upper perforated floor dividing said bin into an upper chamber thereabove to carry a first column of grain in the drying thereof and a lower chamber therebelow, said first upper perforated floor having a centrally disposed discharge opening for permitting movement of the grain from the column thereof in the upper chamber to the lower chamber, a sweep auger pivotally mounted at its inner end above said centrally disposed discharge opening and extending radially outwardly over said floor to a position adjacent said cylindrical wall, means revolving said sweep auger about its pivotally mounted inner end and rotating said sweep auger about its radial axis, a second grain spreader disposed beneath said centrally disposed discharge opening in said first upper perforated floor to spread the grain over the circular area of the bin defined by the cylindrical wall, a second lower perforated floor horizontally disposed at a location near the bottom of said bin and defining the lower end of the lower chamber, said second lower perforated floor defining the top of a sub-chamber in the bin utilized to remove dried grain from the bin, said second lower perforated floor having a centrally disposed discharge opening for permitting movement of the grain from the lower chamber to the sub-chamber, a second sweep auger pivotally mounted at its inner discharge end above said centrally disposed discharge opening in said second floor and extending radially outwardly over said second floor to a position adjacent said cylindrical wall, means rotating said second sweep auger about its radial axis and revolving it about its pivotal mounting at its inner end, an auger fixedly located in a radial position in said sub-chamber and extending from a position beneath said centrally disposed discharge opening in said second floor to a position beyond the cylindrical wall of the bin, means rotating said auger about its radial axis, said second floor adapted to carry a second column of grain within the lower chamber of the bin, a heating unit carried on the outside of said bin and having hot air passage means communicating with the upper portion of said lower chamber for passage upwardly through the first upper perforated floor and through the column of grain in the upper chamber, said conical shaped top having a vent in the side thereof spaced from the inlet opening to exhaust the moist hot air after it has passed through the column of grain, a cooling unit carried on the outside of said bin and having cold air passage means communicating with said sub-chamber for passage upwardly through the second lower perforated floor and through the column of grain in the lower chamber and thereafter admixing with the hot air for passage up through the first upper perforated floor and through the column of grain in the upper chamber and thence out the vent in the conical shaped top, and said auger in said sub-chamber adapted to remove the dried grain from the bin.

4,217,702

MATHEMATICAL FUNCTION GRAPHIC DISPLAY

Paul W. Bennett, 511 Long Plain Rd., Leverett, Mass. 01054

Filed Aug. 24, 1978, Ser. No. 936,499

Int. Cl.³ G09B *23/02*

U.S. Cl. 35—30 **1 Claim**

1. Apparatus for displaying graphically a mathematical function, plotted on one coordinate of a two-dimensional rectangular coordinate display graph, of a variable, plotted on the other coordinate of the display graph, such apparatus comprising:

at least one integrator, responsive to a reset control signal, and a forward/reverse signal, each of which signals have high and low logic levels, a reset value signal, and a voltage input signal V_i, such integrator providing a voltage output V_o being the sum of (i) a voltage constant k, capable of being established at the time the reset control signal

impressed on the integrator is high, and which voltage constant is linearly related to the reset value signal, and (ii) some constant c times the integral of the voltage input signal over the time beginning immediately after the reset control signal has returned to a low logic level after being at a high logic level, wherein the constant c is equal to a given value d when the forward/reverse signal is high and is equal to minus d' times the given value when the forward/reverse signal is low, wherein d' is $\geqq 1$;

whereby the integrator output V_o is reflective of the formula $V_o = k + d\int V_i\,dt$, when the forward/reverse signal is high and the reset control signal is low and therefore the apparatus is in a plotting mode, and whereby the integrator output V_o is reflective of the formula $V_o = k - d'\int V_i\,dt$, when the forward/reverse signal is low and the reset control signal is low and therefore the apparatus is in a retrace mode;

at least one limit sensor, the input of which is connected to the output of an integrator included among the at least one integrator, such limit sensor having one voltage output when its voltage input is within predetermined limits and another voltage output when its voltage input is outside those limits,

first means, for generating a forward/reverse signal, responsive to each limit sensor included among the at least one limit sensor, the output of such first means being connected to the forward/reverse signal input of each integrator, such first means output toggling between high and low logic levels each time any limit sensors indicates an outside-limit condition, i.e. such output, if high, becoming low, or, if low, becoming high, when an outside-limit condition is indicated;

second means, for generating a reset control signal, responsive to at least one limit sensor, the output of such second means being connected to the reset control signal input of each integrator included among the at least one integrator, such means generating a low logic level signal unless any limit sensor indicates an outside-limit condition while the forward/reverse signal is low, whereupon the reset control signal is at a high logic level for a duration sufficient to allow all integrator outputs to reach equilibrium;

third means, for generating a trace select signal, responsive to the states of the Reset control signal and of the forward-/reverse signal, such third means output toggling between high and low logic levels, and changing state each time the reset control signal becomes too high;

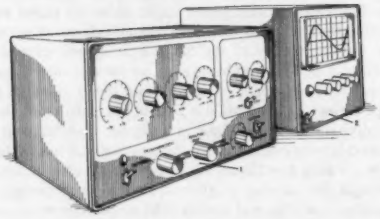
means for connection to an oscilloscope of the type having separate x and y inputs for electronic signals representative of horizontal and vertical rectangular coordinate respectively;

and a third input hereinafter referred to as the z input, for intensity modulation or the display of the coordinate pair represented at the x and y inputs; such means hereinafter referred to as "x outputs" as to the element of such means for connection to the x input, "y output" as to the element of such means for connection to the y input, and "z output" as to the element of such means for connection to the z input;

at least two integrators connected in tandem;

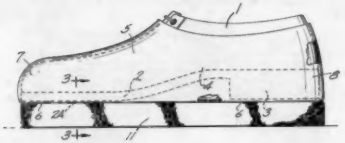
an electronic switch, itself connected switchably to the y output, such electronic switch alternately connecting the y output to a signal emerging from either of two different integrators; such electronic switch changing state in response to a digital signal present at an electronic switch input, such electronic switch input connected to the trace select signal; and

means for generating a trace blanking signal, such signal having the same digital states as the forward/reverse signal, and such trace blanking signal connected to the z output, so that the display is blanked whenever the trace blanking signal is high and thus operative only when the forward/reverse signal is low.



4,217,703
Patent Not Issued For This Number

4,217,704
FOOTWEAR
Mervin A. Whitaker, P.O. Box 3702, Eugene, Oreg. 97403
Filed Jun. 29, 1978, Ser. No. 920,454
Int. Cl.[2] A43B *3/16*
U.S. Cl. 36—7.1 R **3 Claims**



1. Protective non-slip footwear for wearing over conventional footwear to protect the sole, heel and upper of same from damaging chemical floor treating compounds, said non-slip footwear comprising,

a flexible shell for retentive engagement with the conventional footwear, said shell including toe and heel portions for substantially enclosing the conventional footwear upper and also including a continuous planar bottom wall extending the length of the shell subjacent the sole and heel of the conventional footwear, and

a pad attached to said planar bottom wall of said shell and coterminous therewith, said pad being of synthetic fibres

and having upper and lower pad surfaces lying in spaced apart planes with the lower pad surface being of randomly orientated synthetic fibres to provide a high degree of traction for the protective footwear.

4,217,705

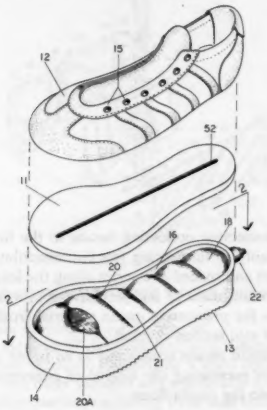
SELF-CONTAINED FLUID PRESSURE FOOT SUPPORT DEVICE

Byron A. Donzis, 24 Lana La., Houston, Tex. 77027

Continuation-in-part of Ser. No. 842,250, Oct. 14, 1977, which is a continuation-in-part of Ser. No. 774,276, Mar. 4, 1977, abandoned. This application Jul. 27, 1978, Ser. No. 928,425

Int. Cl.[2] A43B *13/20, 13/38*

U.S. Cl. 36—29 **10 Claims**



1. A self-contained foot cushioning device comprising:

two superimposed plies of a lightweight, flexible, non-elastic, fluid-impervious woven fabric material, of a shape generally suited to cushion a foot, or selected portions of a foot;

the adjacent surfaces of which are sealed around the periphery thereof to form a pressure-tight bladder which, when pressurized with a pressurizable fluid under sufficient pressure to adequately support and cushion the forces applied by the human foot, does not weaken or lose its shape;

the adjacent surfaces of which are also sealed within the periphery at preselected regions disposed generally perpendicular to the transverse axis of said bladder to define a plurality of internal chambers within said bladder at least some of which are fluidly communicable with each other;

restricted fluid passageways communicating between adjacent chambers, defined at the periphery of the bladder during the sealing process by leaving unsealed a portion of the surfaces between the peripheral seal and the inner sealed regions of the bladder, and sized appropriately to permit a restricted fluid flow from one chamber to another whereby pressure equalization between chambers may take place when the bladder is pressurized but with a back-pressure build-up effect sufficient to prevent sudden surges of fluid from one chamber to another and to provide additional pressure to resist and cushion the impact of sudden heavy forces on the outside of the chamber.

4,217,706

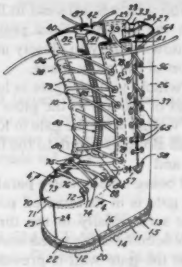
BOOT FOR WALKING CAST

Vincent A. Vartanian, 11187 Jim Pl., Warren, Mich. 48089

Filed Jul. 18, 1979, Ser. No. 58,550

Int. Cl.[3] A43B *11/00*

U.S. Cl. 36—110 **9 Claims**



1. In a weatherproof boot for a surgical walking cast having leg and foot portions, the combination comprising:

(a) an enclosed foot portion having an outer sole means;

(b) a leg portion attached to the foot portion and including a pair of side parts;

(c) each of said side parts having an intermediate adjustable gusset means;

(d) means for connecting together and disconnecting the rear ends of the leg portions for closing and opening, respectively, the rear end of the boot leg portion; and,

(e) means for connecting together and disconnecting the leg portions at their front ends for closing and opening, respectively, the front end of the boot leg portion.

4,217,707

SNOW RETAINING GATE FOR SNOW PLOW

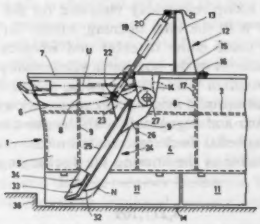
Gustav Karlsson, Linköping, Sweden, assignor to GK Haninge Maskiner AB, Linköping, Sweden

Filed Jan. 11, 1979, Ser. No. 2,714

Claims priority, application Finland, Jan. 24, 1978, 780210

Int. Cl.[3] E01H *5/00*

U.S. Cl. 37—41 **3 Claims**



1. A snow plow of the type comprising a horizontally elongated plow blade having a substantially vertical lower portion and an upwardly and forwardly curved upper portion, said plow blade being adapted for mounting on a carrying vehicle with its length extending obliquely to a normal direction of vehicle travel so that one end of the plow blade is substantially behind the other in said direction of travel, and a snow retaining gate in front of the plow blade near said one end thereof, said gate comprising a gate wall and being swingable between a raised position in which said gate wall is substantially horizontal and is at a level near the top of the plow blade and a lowered position in which the gate wall is substantially upright

and has a lower edge near the level of the lower edge of the plow blade, said snow plow being characterized by:

A. said gate being mounted for swinging motion about a substantially horizontal axis which extends at an oblique angle to the length of the plow blade such that said axis is substantially parallel to said normal direction of travel;

B. said gate wall having

(1) a rear portion which is adjacent to the plow blade and which, with the gate in raised position, curves rearwardly and downwardly to closely underlie the curved upper portion of the plow blade,

(2) a top edge which, with the gate in lowered position, is near the level of the top of the plow blade, and

(3) a rear edge which, with the gate in lowered position, is contiguous all along its length to the front surface of the plow blade; and

C. said gate wall being substantially parallel to said axis so that when the gate is in its lowered position its wall extends edgewise substantially in the direction of vehicle travel and snow accumulating in the corner defined by the plow blade and the gate wall is prevented from passing around the gate wall.

4,217,708

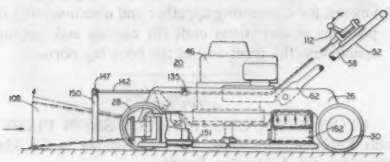
CONVERTIBLE SNOW REMOVING AND GRASS CUTTING DEVICE

Harlan E. Prenatt, 650 Fairborn Rd., Cincinnati, Ohio 45240, and Mark E. Prenatt, Ohio, assignors to by said Mark E. Prenatt said Harlan E. Prenatt, Cincinnati, Ohio

Filed Feb. 21, 1979, Ser. No. 13,428

Int. Cl.[2] E01H *5/04*

U.S. Cl. 37—43 L **5 Claims**



1. A device for removing snow which comprises a housing of inverted cup shape including an upright annular wall, a bottom plate removably mounted on the housing to close the lower side thereof, there being an inlet opening in the upright wall, a hollow scoop removably mounted on the housing in communication with the inlet opening, means for advancing the housing to cause snow to enter and advance along the scoop into the interior of the housing, a substantially horizontal bar rotatably mounted inside the housing, means for rotating the bar about an upright axis, bucket means mounted at end portions of the bar and engageable with the snow entering the housing, and tangential discharge conduit means communicating with the interior of the housing for discharging the snow.

4,217,709

SUBMARINE SAND SAMPLER

Frederick M. Casciano, Honolulu, Hi., assignor to The Research Corporation of the University of Hawaii, Honolulu, Hi.

Filed Feb. 24, 1978, Ser. No. 880,746

Int. Cl.[2] E02F *3/88*

U.S. Cl. 37—62 **26 Claims**

1. A submarine excavating apparatus comprising

an intake nozzle configured for penetrating an ocean floor and having a slurry intake port for receiving a slurry of excavated material and seawater and having an open upward end

a jet pump connected to the open upward end of the intake nozzle for entraining slurry from the nozzle

a first conduit having an upper end and having a lower end communicating with the jet pump for receiving slurry from the jet pump

a second conduit concentrically surrounding the first conduit connected to the jet pump for supplying fluid to the jet pump whereby fluid entrains the excavated material-seawater slurry and drives the slurry through the first conduit

means for connecting a source of pressurized fluid to the second conduit

means for connecting collecting means to the first conduit and a plurality of lubricating jets circumscribing the second conduit and spaced in a series along the length of said second conduit, some of said jets having upwardly pointing nozzles for preventing ocean material from clogging the path of said second conduit,

depth penetration means connected to an upper end of the conduits for measuring the degree of penetration of the conduits into the ocean floor.

4,217,710

FRAMELESS SUPPORT FOR PICTURES

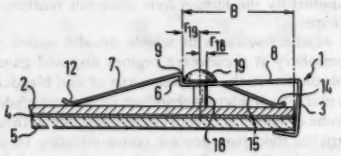
Rolf Becker, Schillstrasse 7, D-3440 Eschwege, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,372

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 7736004

Int. Cl.[3] A47G *1/06*

U.S. Cl. 40—156 **17 Claims**



1. A frameless support for pictures comprising in combination:

a backing plate having a plurality of pins fixedly joined thereon in spaced relationship, each pin having a shank portion and a head portion;

a plurality of clips, each clip having a slotted resilient retaining element at one end and a hook element at the opposite end; said slotted resilient retaining element having first and second parts of generally the same lengths said parts

being out of alignment with each other in the longitudinal direction by means of a step transverse thereto; and

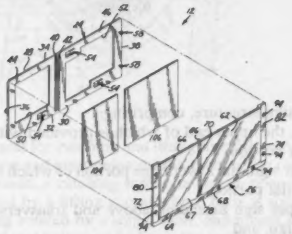
said hook element fixedly joined to the slotted resilient retaining element of the clip wherein the first and second parts of the slotted resilient retaining element form a continuous springing arch member with the end portions of the arch member each resting on the back side of the backing plate and wherein said slotted area extends along the longitudinal axis of the clip past the step as far as the second part of the slotted resilient retaining element with the slot width being somewhat greater than the diameter of the shanks of the pins.

4,217,711

ADVERTISING DISPAY UNIT FOR SHOPPING CARTS

Howard L. Spresser, St. Louis Park, and Darrell W. Miller, Golden Valley, both of Minn., assignors to Advocart, Inc., St. Louis Park, Minn.

Filed Feb. 9, 1978, Ser. No. 876,279
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—308 **14 Claims**



1. An advertising display unit for use with a shopping cart, comprising:

a flat base member of rigid material;

a cover member of rigid material with dimensions similar to said base member, comprising a main body portion with inner and outer surfaces and a generally U-shaped, frame-like edge portion extending from said main body portion and located in a plane offset from a plant defined by said main body portion;

means for mounting said cover member on said base member with said U-shaped edge portion in contact with said base member and with said main body portion spaced therefrom to define a recess therebetween and an open slot along one edge thereof;

ridge means for dividing said recess into a plurality of adjacent pockets to hold advertising material, said ridge means extending from each member and overlapping to seal said pockets from one another;

at least the portions of said cover member disposed over said pockets being transparent to display said advertising material; and

means for mounting said base member and attached cover member on said cart with said open slot facing upwardly to permit insertion of advertising material through said slot into said recess.

4,217,712

CONICAL PEN

Harold E. Koeln, St. Louis County, Mo., assignor to Penn Corporation, Princeton, N.J.

Filed Oct. 16, 1978, Ser. No. 951,528
Int. Cl.[2] G09F *19/06, 23/00*
U.S. Cl. 40—334 **8 Claims**

1. A pen comprising a case and writing mechanism in said case, said case having a central axis of rotation and a side at an angle to said axis and revolved around said axis forming a cone having a smaller end and a larger end, said larger end being bounded by said revolved side and forming an ellipse, the writing mechanism in said case projecting from the smaller end thereof, a wall in said case adjacent the larger end and a small

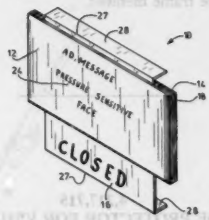
distance from said larger end, a closed compartment in said case extending from adjacent said wall toward said smaller end of said case, and means for viewing the interior of said compartment from outside sid case.

4,217,713

SLIDABLE WINDOW SIGN

William Greenberger, White Plains, N.Y., assignor to The Hopp Press Incorporated, New York, N.Y.

Filed Jan. 12, 1979, Ser. No. 3,095
Int. Cl.[3] G09F *7/10, 19/02*
U.S. Cl. 40—488 **2 Claims**



1. A sign adapted for attachment to a window, comprising:

a first panel having a front surface and a rear surface, the front surface adapted for attachment to a window said front surface of said first panel is pressure-sensitive over its entire area such that when said surface is attached to a window, water is substantially precluded from entering between said front surface and said window;

a second panel attached to the first panel in such a manner that a space is provided between the two panels, and

a slidable member positioned within said space between the panels and slidable therein said first and second panels are substantially rectangular and substantially the same size, the slidable member being substantially rectangular and having a pair of opposing foldable ends adapted to contact opposing edges of said panels when in a folded position, said slidable member being removable from between said panels when at least one of said ends is in an unfolded position, said slidable member includes at least one protrusion for providing frictional contact with at least one panel.

4,217,714

DISPLAY SIGN

Charles F. Ramsay, Knoxville, Tenn., assignor to A & E Plastik Pak Co., Inc., Industry, Calif.

Continuation of Ser. No. 824,518, Aug. 15, 1977, abandoned. This application Jun. 1, 1979, Ser. No. 44,712
Int. Cl.[2] G09F *13/04*
U.S. Cl. 40—549 **14 Claims**

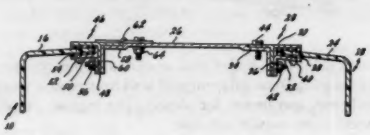
1. A display sign, including:

a frame member extending around the perimeter of the sign and having sides substantially parallel to a common axis,

at least one face member having a copy area located in a plane substantially perpendicular to the common axis,

the face member including substantially straightsided flange portions provided at its ends with a particular thickness and angularly disposed to the copy area in a direction substantially parallel to the frame member and displaced from the frame member, and

a retainer member disposed in substantially flush relationship



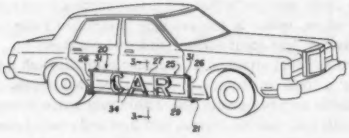
with the frame member and coupling the frame member and the flange portions of the face member and including an opening substantially equal to the particular thickness of the flange portions for receiving the flange portions in substantially aligned relationship with the sides of the frame member and the substantially straight-sided flange portions of the face member and thereby making the copy area of the face member substantially coextensive with the sides of the frame member.

4,217,715

SIDE PROTECTOR FOR VEHICLES

William G. Bryan, Jr., 7335 Amhurst La., Clearwater, Fla. 33516

Filed Feb. 8, 1979, Ser. No. 10,248
Int. Cl.[2] G09F *21/04*
U.S. Cl. 40—591 **9 Claims**



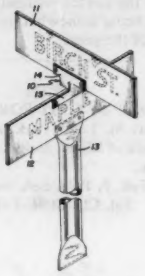
1. A side protector for vehicles comprising a horizontal U-frame, the sides of said U-frame adapted for support slidingly in brackets attached beneath a vehicle floor with the U-frame held closely beneath the floor and being shiftable horizontally between a retracted position beneath the floor and an extended position beyond the floor, a vertically swingable vehicle side protector portion pivoted to the sides of said U-frame near and inwardly of the outer ends of the sides, resilient pad means on the interior side of said swingable protector portion and being engageable with the adjacent side of the vehicle when said protector portion is in an upright use position, said swingable protector portion including a lower bar adapted to rest on the sides of said U-frame in two positions on opposite sides of the pivots of said protector portion when the latter is upright and horizontal so that said protector portion cannot pass below horizontal or beyond the vertical in one direction of swing, and yielding spring means connected with the U-frame and with vehicle structure and biasing said U-frame toward said retracted position but allowing it to be pulled toward said extended position.

4,217,716

STREET SIGN STRUCTURE

Pompeli F. Acquaviva, P.O. Box 231, South Yarmouth, Mass. 02644

Filed Sep. 12, 1977, Ser. No. 832,783
Int. Cl.[2] G09F *15/00*
U.S. Cl. 40—607 **9 Claims**



1. Street sign structure, comprising:

(a) a post, the upper end of which is provided with a generally flat portion,

(b) a lower sign, the lower edge portion of which is attached to said flat portion,

(c) an upper sign extending above and transversely of the lower sign, and

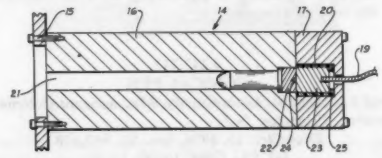
(d) a connector element having a flat generally rectangular lower portion attached to the upper edge portion of the lower sign, a flat generally rectangular upper portion attached to the lower edge portion of the upper sign, and a connector portion consisting of two flat panels integrally joined at a right angle, the upper edge of one of the panels being integrally connected to the lower edge of the upper portion and lying in the same plane as the upper portion, and the lower edge of the other panel integrally connected to the upper edge of the lower portion and lying in the same plane as the lower portion.

4,217,717

AUTOMATIC WEAPON SIMULATOR

Michael P. Canty, Bloomington, Ind.; Don W. Caudy, Dublin; Donald J. Hackman, Columbus; Jeremy M. Harris, Worthington; Robert W. Mowery, Columbus; George R. Riley, Grove City, and Beverly D. Trott, Columbus, all of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 11, 1977, Ser. No. 787,726
Int. Cl.[3] F41C *27/00*
U.S. Cl. 42—1 R **12 Claims**



1. A device for simulating the firing of an automatic weapon comprising,

a plurality of pyrotechnic devices,

means for detonating said pyrotechnic devices, and

timing means providing both single signals and bursts of signals connected with said means for detonating whereby said pyrotechnic devices are detonated to simulate the firing of an automatic weapon.

4,217,718

APPARATUS FOR CATCHING AND LIFTING LIVE FISH

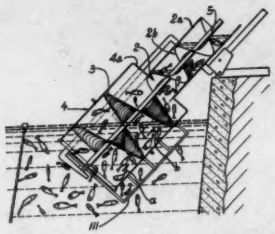
Claude Faivre, 7, rue de l'Industrie, 25110 Baume les Dames, France

Filed Jul. 31, 1978, Ser. No. 929,108

Claims priority, application France, Aug. 4, 1977, 77 24982; Feb. 24, 1978, 78 06552

Int. Cl.[2] A01K *79/00*

U.S. Cl. 43—6.5 **9 Claims**



1. Apparatus for catching and lifting live fish, provided with transportation and positioning means, comprising rotatable in a common sheath, a catching screw having an open-work helix and extended by a lifting screw whose helix is solid, the two helices being rotated by a single shaft, and means at the junction point of said helices to facilitate the free passage of the fish from the lattice-work portion to the solid portion.

4,217,719

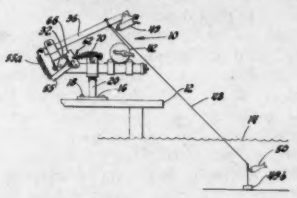
FISHING APPARATUS INCLUDING A COMBINED AUTOMATIC HOOKER AND LINE PROPELLING MEANS

Leo G. McDonnell, 19117 Kinloch, Detroit, Mich. 48240

Filed Jan. 19, 1979, Ser. No. 4,717

Int. Cl.[3] A01K *91/06*

U.S. Cl. 43—15 **5 Claims**



1. Fishing apparatus comprising:

a support;

an elongated tubular housing mounted on the support;

a fishing reel and means mounting the reel on said housing;

a fishing line having one end wound on said reel, and an opposite unwound end;

a pilot rod and means connecting the pilot rod to the housing for pivotal motion thereto, from a first position to a second position;

eye means on said pilot rod for supporting said line unwound from said reel;

latch means including a first latch member, and connector means connected to the support, said connector means being engaged by the first latch member for releasably retaining the pilot rod in said first position, and a second latch member disposed to engage the connector means to retain the pilot rod in a third pivotal position, between said first position and said second position, the connector means being responsive to a first motion of the unwound line to release the pilot rod for motion toward said third position, and being responsive to a second motion of the unwound line to release the pilot rod for a motion from said third position to said second position; and

bias means connected to the pilot rod for urging it toward said second position in a motion operative to move the unwound end of the fishing line in a predetermined motion with respect to the reel.

4,217,720

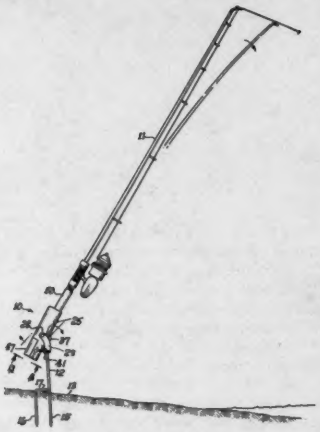
FISHING ROD HOLDER

Ralph G. Karr, 19905 Meadows Ct., Cerritos, Calif. 90701

Filed Oct. 23, 1978, Ser. No. 953,918

Int. Cl.[3] A01K *97/12*

U.S. Cl. 43—17 **11 Claims**



1. A fishing rod holder for signaling the presence of a fish on the line of the rod, said holder comprising:

a vertical support member;

a frame member affixed to said support member;

holding means held by said frame member;

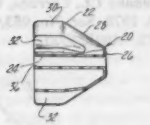
a fishing rod holding tube attached to said holding means, said tube having a fishing rod holding means at its upper end and being equipped with biasing means urging the upper end of said tube in an upward direction, said tube being affixed to said holding means so that the axis of the tube is at an angle of between 10 and 45 degrees with respect to said vertical support member when said tube is in its maximum upward position, said tube being further affixed to said holding means so that its upper end may move to a downward position so that the axis of the tube is at an angle of between 50 degrees and 70 degrees with respect to the vertical support member;

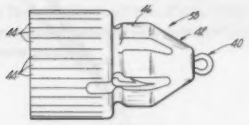
a push-button switch attached to said tube at an angle of between 110 and 140 degrees with respect to the axis of the tube as measured from the upper end of the tube;

an adjustable button-switch-actuating member rigidly but adjustably affixed with respect to said frame member, said adjustable button switch activating member being movable through a range of heights so that said button switch is closed over an adjustable angle of at least 20 degrees; and

signaling means electrically connected to said push-button switch whereby said signaling means is activated when said tube is moved downwardly.

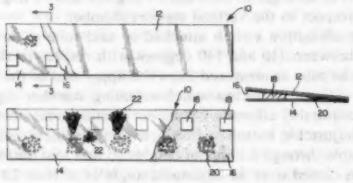
4,217,721
WEEDLESS FISHHOOK
Welcome D. Hershberger, 16135 Petro Dr., Mishawaka, Ind. 46544
Filed Nov. 3, 1978, Ser. No. 957,646
Int. Cl.[3] A01K *83/00*
U.S. Cl. 43—43.2 **5 Claims**





1. A weed shield attachment for a fishhook that has a stem terminating at one end in a return bent portion with a pointed barb at its terminus, said pointed barb being located radially outwardly of said stem, said attachment being formed of thin sheet material and comprising an external bulbous shirt having head and tail ends, and an internal sleeve integrally connected to said skirt only at said head end, said sleeve having an internal diameter of a size sufficient so that it can fit on the stem of said hook, and said skirt flaring outwardly in spaced relationship to said sleeve from said head end toward said tail end and terminating in a generally cylindrical portion at said tail end and having an external diameter at said tail end so that it can fit in close proximity to the radially inner side of the barb, said cylindrical portion having at least one longitudinally extending groove projecting radially inwardly in which the barb of the fishhook can be located, said skirt having resilient form sustaining properties to enable it to deflect weeds from the barb and yieldable so that it can collapse in response to a fish striking the hook.

4,217,722
INSECT TRAP
Malcolm McMullen, 1713 Tarleton Way, Crofton, Md. 21114
Continuation-in-part of Ser. No. 773,218, Mar. 1, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,366
Int. Cl.[3] A01M *1/14*
U.S. Cl. 43—114 **16 Claims**



1. An insect trap for placement on a planar surface comprising

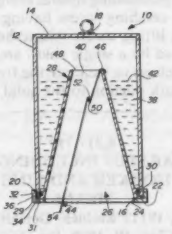
(a) upper and lower sheet portions of substantially the same size arranged in opposed relation, the lower sheet portion being engaged with the planar surface

(b) means for connecting said upper and lower sheet portions together, and leaving the remainder of the sheet portions spaced a predetermined distance apart

(c) said lower sheet portion being made of a plastic material having a slick surface, and

(d) adhesive means on the inner face of said upper sheet portion whereby, the backs of the insects will engage the adhesive means on the upper sheet portion, the insects feet will slip upon being caught by their backs and the insects will be unable to generate sufficient traction to free themselves from the trap.

4,217,723
FLY CATCHER
Frank Hrebec, 25287 Lehnep, Roseville, Mich. 48066
Filed Nov. 9, 1978, Ser. No. 959,252
Int. Cl.[2] A01M *1/02*
U.S. Cl. 43—122 **3 Claims**



1. A trap for catching flies comprising:

a cylindrical glass outer shell with a closed top and open bottom, a threaded portion along the outside periphery of the outer shell extending up from the bottom a distance;

a truncated hollow cone with a bottom diameter sized to slidingly fit the inside diameter of the outer shell, the bottom diameter extending up from the bottom a distance, a groove spaced up from the bottom a distance extending around the periphery of the bottom diameter, the groove sized to receive an elastic ring which is squeezed between a bottom of the groove and the inside diameter of the outer shell, the truncated cone terminating at an open top a distance down from the closed top of the outer shell;

a flange having flat bottom and a loop integral therewith bonded to the outer surface of the closed top to provide a means for rotating the trap;

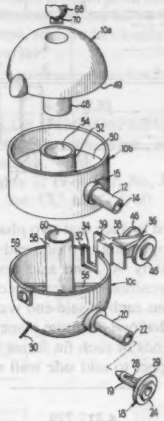
a bottom retainer comprising an outer wall threaded along an inside diameter to threadingly engage the threaded portion of the outer shell, a bottom wall projecting inward a distance, a bottom opening equalling an inside bottom diameter of the hollow cone; and

a wire bait hanger having a hook at its upper end to support the hanger at a top edge of the cone, a notch bent in the wire proximate the upper end to support a piece of bait for attracting flies, a lower end of the wire extending below the bottom opening a distance, wherein the bait can be changed without disassembly of the trap.

4,217,724
INTERLOCKING WHEELED FIGURE CONSTRUCTION TOY

Palmer J. Schoenfield, Evanston; Denise Gardner, Downers Grove, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 2, 1978, Ser. No. 956,919
Int. Cl.³ A63H *33/00, 11/10, 11/00;* **A63F** *9/08*
U.S. Cl. 46—22 **10 Claims**



1. A toy robot, comprising:
an upper and lower torso portion, each including at least one peripheral interfacing surface defining a plane and a connecting post normal to and through said plane;
a central cylindrical torso portion including a pair of surfaces for engaging the interfacing surfaces of the upper and lower housing portions, a centrally positioned circular web and an aligning post mounted in the center thereof and extending in both directions therefrom for receiving the connecting posts of said upper and lower torso portions;
means for securing the aligned torso sections as a unitary structure comprising the aligning post being sized to receive the connecting posts for alignment and a locking element and a keyed locking rib in one of said connecting posts;
a pair of arms rotatably mounted on a pair of generally oppositely extending shafts provided on the central housing portion; and
support means on said lower housing portion comprising a plurality of rotatably mounted wheels for rollably supporting the toy on a suitable surface.

4,217,725
COMBINATION DOLL AND ACCESSORY ARTICLES

Jurgis Sapkus, Manhattan Beach, and J. Stephen Lewis, Pacific Palisades, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

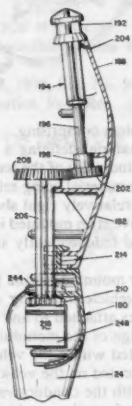
Filed Oct. 16, 1978, Ser. No. 952,014
Int. Cl.³ A63H *29/16;* **A63J** *3/00;* **A63H** *11/00, 13/16*
U.S. Cl. 46—44 **14 Claims**

1. In a toy, the combination comprising:
a doll including a doll covering and having a torso with bellows means therein with at least a portion of the doll covering in proximity to said bellows means being flexible;
an arm member on said doll, said arm member having an aperture in the hand portion thereof and air passage means interconnecting said bellows means and said aperture; and
a detachable article configured for engagement with the hand of said doll and having means in fluid communication with said aperture, said article having means movable in response to compression of said bellows means.

4,217,726
DOLL WITH MOVABLE LEGS, HEAD, TILTABLE TORSO

Alcwyn Flicker, Carson; Derek J. Gay, Rancho Palos Verdes; Tony Rhodes, Torrance, and Roger H. Sweet, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 832,456, Sep. 12, 1977, Pat. No. 4,141,176.
This application Nov. 6, 1978, Ser. No. 958,455
Int. Cl.³ A63H *13/02*
U.S. Cl. 46—120 **3 Claims**



1. In a doll, the combination comprising:
an upper torso member having a neck opening;
a lower torso member;
a torso coupling member integral with one of said torso members, said torso coupling member having an aperture extending axially therethrough;
an opening in the other of said torso members for rotatably receiving said torso coupling member for enabling said torso members to be rotated relative to each other;
a shaft member extending longitudinally through said aperture;
a first leg member secured to said lower torso member for pivotal movement relative thereto about a side-to-side axis;
means within said lower torso member operatively connected to rotate said shaft member about its longitudinal axis in response to pivotal movement of said first leg member;
a head supporting member rotatably mounted in said upper torso member in said neck opening, said head supporting

member having means thereon in operative engagement with said shaft member for rotatable movement of said head supporting member in response to pivotal movement of said first leg member; and

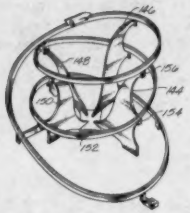
a second leg member hingedly coupled to said lower torso member about a fore-to-aft axis for providing angular displacement between said second leg member and the longitudinal center line of the so-connected torso members, whereby the relative displacement between said first and second leg members in mutually perpendicular directions can result in tilting the torso members relative to said second leg member and rotating said head supporting member in response to pivotal movement of said first leg member.

4,217,727

MINIATURE MONORAIL SYSTEM

Warren N. Fetty, P.O. Box 306, and Rosabelle Fetty, both of P.O. Box 306, Altadena, Calif. 91001

Filed Jul. 31, 1978, Ser. No. 929,288
Int. Cl.³ A63H *18/12*
U.S. Cl. 46—257 **37 Claims**



1. A monorail system comprising

a length of flat material defining a monorail have a recess extending longitudinally of the length of material on each side thereof, the material being relatively flexible about its lateral axis and relatively rigid about its longitudinal axis;

a flexible conductive strip mounted in each recess, each strip being freely and independently slidable in its respective recess;

a vehicle movably mounted on one longitudinal edge of the monorail, said vehicle including a plurality of elongated horizontal rollers attached to and supporting said vehicle on the upper edge of the monorail;

motor means located within the vehicle;

contact means mounted on the vehicle for establishing electrical contact with the conductive strips and transmitting electrical power from the conductive strips to the motor means;

drive means mounted on the vehicle in frictional contact with the monorail;

means for transmitting mechanical drive force from the motor means to the drive means; and

means for transmitting electric power from a source of electrical power to the conductive strips.

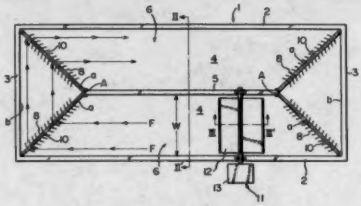
4,217,728

APPARATUS FOR CULTIVATING ALGAE

Hidenori Shimamatsu, Chiba, and Yutaka Tominaga, Ichihara, both of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Filed Oct. 10, 1978, Ser. No. 950,042
Claims priority, application Japan, Oct. 11, 1977, 52-120913
Int. Cl.² A01G *33/00*
U.S. Cl. 47—1.4 **3 Claims**

1. An apparatus for cultivating algae, said apparatus comprising (1) a cultivation basin adapted to permit a horizontal circulating flow of cultivation water and composed of a rectangular bottom wall, two upstanding side walls and two upstanding end walls on the edges of the bottom wall and a partition located intermediate the two side walls and connected only to the bottom wall, (2) a flow driving means for circulating the cultivation water, and (3) a flow rectifying means; said flow rectifying means being composed of a support member and a plurality of parallel fins made of a gently curved rectangular thin plate secured to the support member, each of said fins



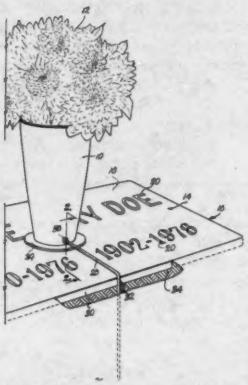
having such a curved surface that two phantom planes tangent respectively to the opposing two side ends of each fin form an angle of approximately 90°, and said flow rectifying means being provided at a position connecting a corner at which each of said side walls joins each of said end wall to the end portion of said partition so that one phantom plane containing both the two opposing side ends of each fin forms an angle of approximately 45° with respect to said side wall and said end wall.

4,217,729

FLOWER CUP FOR GRAVE MARKER

Albert D. Cooper, 3601 W. 98 St., Overland Park, Kans. 66206

Filed Nov. 13, 1978, Ser. No. 959,685
Int. Cl.³ A01G *5/04*
U.S. Cl. 47—41 G **1 Claim**



1. A flower cup for mounting on a plaque-like grave marker normally having a generally flat upper face and disposed with such face substantially at ground level, said flower cup comprising:

an upright, hollow, open top, flower- and water-receiving vessel having a solid, disc-like bottom section and a sidewall integral therewith;

an out-turned supporting flange surrounding said bottom section, integral therewith and projecting outwardly beyond the bottom peripheral edge portion of the sidewall of the vessel;

an L-shaped rod of a circular section for anchoring said vessel in the ground, said rod presenting an elongated vertical leg with the lower end thereof pointed to facilitate insertion into the ground, and a horizontal leg with

one end integral with the upper end of said vertical leg, screw threads at the opposite end thereof, and a length greater than the horizontal diameter of said flange; and

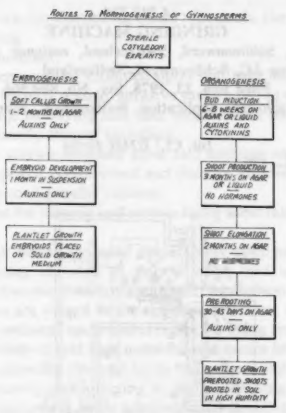
means for removably mounting said rod to said bottom section, said means including a tube extending radially inwardly into and tightly fitted within said bottom section and being provided with internal screw threads for cooperative engagement with the screw threads on said horizontal leg, such that when said rod is in engagement with said vessel, said vessel is offset from the vertical leg of said rod, and said horizontal leg lies below the upper surface of said bottom section, so as to be closely adjacent the upper surface of the marker.

4,217,730

EMBRYOGENESIS OF GYMNOSPERM FOREST TREES

Mostafa M. Abo El-Nil, Centralia, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed May 7, 1979, Ser. No. 36,623
Int. Cl.[3] A01G *1/00*
U.S. Cl. 47—58 **11 Claims**


ROUTES TO MORPHOGENESIS OF GYMNOSPERMS
STERILE COTYLEDON EXPLANTS
EMBRYOGENESIS
ORGANOGENESIS
SOFT CALLUS GROWTH 1-2 MONTHS ON AGAR AUXINS ONLY
BUD INDUCTION 4-8 WEEKS ON AGAR OR LIQUID AUXINS AND CYTOKININS
EMBRYOID DEVELOPMENT 1 MONTH IN SUSPENSION AUXINS ONLY
SHOOT PROLIFERATION 3 MONTHS ON AGAR OR LIQUID NO HORMONES
PLANTLET GROWTH EMBRYOIDS PLACED ON SOLID GROWTH MEDIUM
SHOOT ELONGATION 2 MONTHS ON AGAR
PRE-ROOTING 30-45 DAYS ON AGAR AUXINS ONLY
PLANTLET GROWTH PRE-ROOTED SHOOTS ROOTED IN SOIL IN HIGH HUMIDITY

1. A method of generating embryoids from tissues of Douglas-fir (*pseudotsuga menziesii*) trees by plant tissue culture which comprises:

a. excising tissue from a donor plant;

b. culturing the excised tissue on a first medium containing mineral and organic nutrients and auxins as the sole exogenous plant hormone until a soft callus tissue has developed;

c. transferring the callus without significant mechanical disintegration into a suspension medium containing similar nutrient and hormone materials to the first medium, this medium also having auxins as the sole exogenous plant hormone; and

d. agitating the suspension gently so as to permit bipolar embryoids to differentiate and develop.

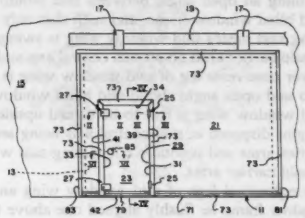
4,217,731

FIRE DOOR

Joseph N. Saino, 6560 Kirby Forest Cove, Memphis, Tenn. 38138

Filed May 10, 1979, Ser. No. 37,858
Int. Cl.[2] E05D *15/48*
U.S. Cl. 49—169 **8 Claims**

1. A fire door for selectively blocking an opening in a wall, said fire door comprising: a fire resistant panel member for substantially covering said opening in said wall, said panel member having a pass opening therethrough, said panel member having a face surface, said pass opening having a first side edge and a second side edge; a fire resistant pass door member for substantially covering said pass opening, said pass door member having a face surface and a first side edge and a second side edge; hinge means for attaching said first side edge of said pass door member to said first side edge of said pass opening of said panel member and for allowing said pass door member to move between a closed position in which said pass opening is substantially covered by said pass door member and an opened



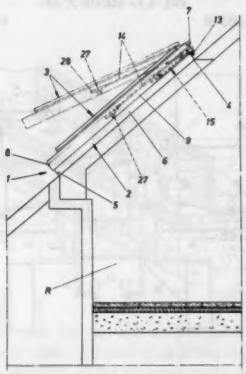
position; peg means for being attached to said second side edge of said pass door member, said peg means including a distal end arranged substantially perpendicular to said face surface of said pass door member for engaging said panel member when said pass door member is in said closed position; and latch means for engaging said panel member when said pass door member is in said closed position.

4,217,732

ROOF WINDOW

Hans U. Reichstadt, Schwarzbachstrasse 41, 4020 Mettmann, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,163
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745192
Int. Cl.[2] E05D *15/48*
U.S. Cl. 49—153 **14 Claims**



1. A roof window of a residential roof comprising

a blind window frame adapted to be secured to a roof and defining an upper axis, said window frame having first longitudinal legs and a first upper and a first lower transverse leg connected together,

carrier arms being articulated to said blind window frame at said upper axis in a vicinity of said upper transverse leg of said blind window frame and extending in the direction of said first longitudinal legs of said blind window frame,

said blind window frame and said carrier arms constituting members,

a window wing including second longitudinal legs and a

second upper and a second lower transverse leg connected together, said window wing being pivotally mounted, about a central axis lying substantially in a longitudinal center line thereof, to said

at least one means for decoupleably connecting said window wing at at least one decoupleable connection point to one of said members such that said window wing is swingable open about said upper axis of said blind window frame defining an open angle between said window wing and said blind window frame, and such that only after decoupling said means said window wing is swingable relative to said carrier arms about said central axis and said second lower transverse leg of said window wing is then tiltable into said open angle above said blind window frame and said window wing is free to be turned upside down,

axial pins disposed at said central axis being seated on said carrier arms and pivotally connecting said window wing to said carrier arms,

said longitudinal legs of said window wing and said blind window frame lie flushly aligned one above the other,

at least one accumulator means for loading said carrier arms and operatively relieving said window wing of load,

said carrier arms and said at least one accumulator means being disposed in the open angle between said window wing and said blind window frame,

said carrier arms defining free ends, respectively, the free ends in an open position of said window wing being swingable out to a distance with respect to said blind window frame, which distance corresponds approximately to half the length of one of said second longitudinal legs of said window wing.

4,217,733

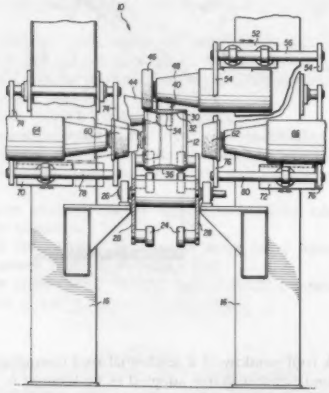
METHOD OF AND APPARATUS FOR EFFECTING COMBINED SURFACE FINISHING OPERATIONS FOR A TAPERED ROLLER BEARING CUP

Robert J. Van Sickle, Richmond, Va., assignor to Rail Bearing Service, Richmond, Va.

Filed Mar. 15, 1979, Ser. No. 20,732

Int. Cl.³ B24B *5/18*

U.S. Cl. 51—103 R **14 Claims**



8. An apparatus for surface finishing roller bearing cups, each of said cups having a cylindrical outer diameter surface and an internal raceway, said internal raceway having opposed inboard and outboard cylindrical counterbores and a pair of conical inboard and outboard raceway surfaces which slope toward a centrally located cylindrical raceway portion, said apparatus comprising:

a. means for feeding roller bearing cups to an indexing means,

b. indexing means to receive said cups and feed them to a surface finishing station,

c. a drive roller engageable with said cylindrical outer diameter of a cup at said surface finishing station to effect rotation of said cup,

d. first brush means engageable with the outer diameter of said cup at said surface finishing station to effect surface finishing of the outer diameter of said cup,

(1) means to rotate said first brush,

e. second brush means engageable with said internal raceway of said cup at said surface finishing station, said second brush means consisting of a pair of brushes mounted for axial motion at opposite ends of the cup being surface finished,

(1) means to rotate said second brush means,

f. and means for receiving said cups after said cups have been surface finished.

4,217,734

GRINDING MACHINE

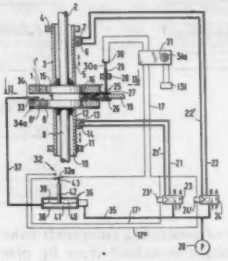
Max Frei, Schönenwerd, Switzerland, assignor to Schenker Maschinen AG, Schönenwerd, Switzerland

Filed Feb. 23, 1978, Ser. No. 880,566

Claims priority, application Switzerland, Mar. 15, 1977, 319277

Int. Cl.² B24B *49/04*

U.S. Cl. 51—118 **14 Claims**

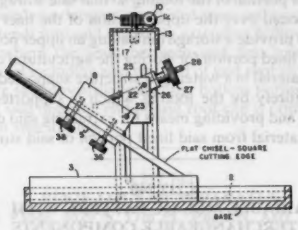


1. In a grinding machine, the combination of first and second rotary grinding wheels having substantially parallel active surfaces facing each other and defining a space whose width varies as a function of wear upon said surfaces; first drive means actuatable to move said first wheel in a direction to reduce the width of said space; means for transporting workpieces along a path which extends through and beyond said space whereby the workpieces are treated by said wheels and their length, as considered at right angles to the planes of said active surfaces, denotes the width of said space; first monitoring means for monitoring the length of workpieces in said path beyond said space; first actuating means for actuating said first drive means; second drive means actuatable to move said second grinding wheel toward said first grinding wheel; marker means defining a fixed reference point in said space; second monitoring means for monitoring the distance between said reference point and the active surface of said second wheel and for generating a monitoring signal when the distance monitored by said second monitoring means exceeds a preselected value; second actuating means for actuating said second drive means; and means for energizing only one of said actuating means when the monitored length of the workpieces exceeds a predetermined value, said energizing means energizing said second actuating means in the presence, and said first actuating means in the absence, of said monitoring signal.

4,217,735
TOOL SHARPENING DEVICE

James McGeoch, deceased, late of Barnegat, N.J., and by Dorothy C. McGeoch, executrix, 110 Harborage Pl., Barnegat, Ocean County, N.J. 08005

Filed Nov. 2, 1978, Ser. No. 957,421
Int. Cl.[2] B24B 3/48
U.S. Cl. 51—158 9 Claims



1. In a device for sharpening chisel type tools, the combination comprising

A. a base member,

B. a sharpening stone mounted upon said base member and secured thereby with an abrasive surface facing upwardly,

C. a carriage overlying said base member and reciprocable longitudinally thereof including

(1) twin screws mounted upon said carriage respectively on opposite sides thereof and thereby disposed in laterally spaced parallel relation,

(2) means for turning said screws at the same rate of speed, and

(3) block means threaded respectively upon said screws for being elevated in unison when said screws are turned in one direction and lowered in unison when said screws are turned in the opposite direction, and

D. means mounted upon said carriage for being reciprocated transversely of said base member, said means being operable for securing the tool to be sharpened, and for selectively raising and lowering it, and positioning it at a selected sharpening angle relative to the abrasive surface of said stone including

(1) a rigid frame extending across said carriage, the opposite end portions of said frame being slidably received respectively by the associated block means,

(2) a plate member mounted upon said frame for being rocked about an axis extending transversely of said base member, and

(3) means interposed between said plate member and frame and operable for positioning said plate member at a selected angle relative to the abrasive surface of said stone.

4,217,736
METHOD FOR AUTOMATICALLY GRINDING LENSES

Hayao Akaba, Akishima; Akira Ikeda, Fussa, and Masayoshi Lee, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Hoya Lens, Tokyo, Japan

Division of Ser. No. 690,781, May 27, 1977, Pat. No. 4,096,684, which is a continuation-in-part of Ser. No. 490,188, Jul. 19, 1974.
This application Sep. 30, 1977, Ser. No. 838,056
Claims priority, application Japan, Oct. 11, 1973, 48-114211
Int. Cl.[2] B24B 1/00
U.S. Cl. 51—284 E 1 Claim

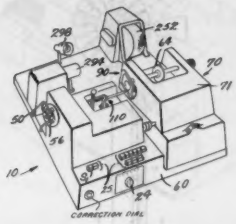
1. A process for automatically grinding lenses for glasses in a lens grinding device comprising the steps of:

securing a glasses frame in the device;

recording a pattern on a recording substrate corresponding to the portion of the glasses frame where the ground lens is to be positioned;

moving the lens to be ground in to a grinding position adjacent a grinding stone;

scanning the recorded pattern and generating a first electrical signal in response to sensing the absence of the recorded pattern and a second electrical signal in response to sensing the presence of the recorded pattern;



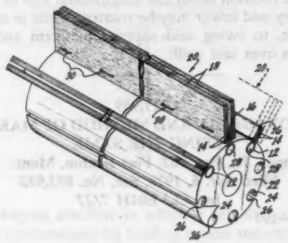
sensing the pressure when the lens and grinding stone are in contact and generating an electrical signal in response to such pressure and

controlling the positioning of the lens to be ground with respect to the grinding stone in response to the generated electrical signals produced so that grinding continues until the recorded pattern is sensed.

4,217,737
ABRASIVE FLAP DRUM

Hiroshi Hasegawa, Whittier, Calif., assignor to Merit Abrasive Products, Inc., Compton, Calif.

Filed Apr. 16, 1979, Ser. No. 30,332
Int. Cl.[2] B24D 13/06
U.S. Cl. 51—334 13 Claims



1. An abrasive pack for use with an elongated hub having a plurality of spaced slots each extending along the length of the hub and with a plurality of the abrasive packs each extending outwardly from the hub and each positioned adjacent an individual one of the slots, each pack including

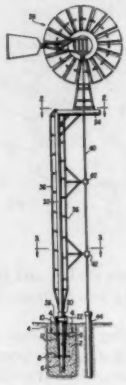
a plurality of abrasive flaps of abrasive material stacked together to form a pack;

a loop of sheet material having end portions and a loop portion;

a supporting strip positioned adjacent the sides of the end portions of the loop of sheet material to support and retain the end portions, and

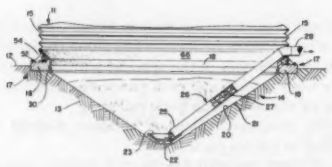
the supporting strip and the end portions disposed between individual flaps in the pack and with the loop portion without the pack for reception within an individual one of the slots for locking the loop portion within the slot.

4,217,738
WINDMILL TOWER
Paul R. Smith, P.O. Box 563, Deming, N. Mex. 88030
Filed Aug. 2, 1978, Ser. No. 930,145
Int. Cl.[2] E04H *12/18*; F04B *17/00*
U.S. Cl. 52—40 **3 Claims**



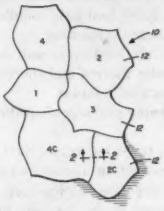
1. A windmill tower comprising:
a base member having means for anchoring the same in the ground laterally adjacent a well;
an elongated upright tower member on said base member and having a support platform fixed at its upper end extending laterally therefrom to a position over said well, said tower comprising a tubular member having external bracing trusses extending longitudinally thereof;
hinge means mounting said tower to said base member for pivotal movement about a horizontal axis whereby said tower may be pivotally lowered, in a direction away from said well, to a horizontal position adjacent the ground including means for locking said tower in said upright position; and
mounting means securing said tower to said hinge means for relative rotation about the longitudinal axis of said tower whereby said tower may be rotated, while in said upright position, to swing said support platform away from a position over said well.

4,217,739
GRAIN STORAGE BIN AND METHOD OF MAKING AND USING THE SAME
Jim G. Granger, Jr., Box 962, Fort Benton, Mont.
Filed Apr. 6, 1978, Ser. No. 893,933
Int. Cl.[3] E04H *7/22*
U.S. Cl. 52—197 **10 Claims**



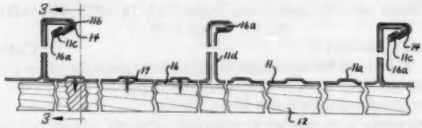
1. A method of constructing a storage bin for storing an agricultural commodity or other free-flowing solid material in a water-impermeable environment comprising the steps of:
constructing a foundation which includes a footing supported by the ground about the footing;
excavating an upwardly opening cavity in the ground adjacent the footing;
shaping the cavity to receive a liquid blocking barrier liner within the cavity and substantially adjacent thereto so that the liner is in register with the cavity;
inserting said liner into said cavity in an inverted orientation so that said liner is substantially entirely supported by the material adjacent to and outside of the liner;
sealing an upper lip portion of the liner to the footing to provide a fluid-tight seal; and
securing an above ground storage portion of a storage bin to an upper portion of the footing so that said storage portion is positioned over the upper portion of the liner cavity,
thereby to provide a storage bin having an upper portion and a lower lined portion for storing the agricultural commodity or material in a watertight structure supported substantially entirely by the footing which is supported by the ground; and providing means for extracting said commodity or material from said lined portion of said storage bin.

4,217,740
VARIABLE MOSAIC PATTERN WITH INTERCHANGEABLE COMPONENTS
Philip N. Assanti, 34 Gamache Rd., Derry, N.H. 03038
Filed Jun. 7, 1978, Ser. No. 915,143
Int. Cl.[2] E04B *2/00*
U.S. Cl. 52—311 **6 Claims**



1. In a surface covering comprising a plurality of interfitting blocks having substantially parallel top and bottom faces and edges interfitting with contiguous blocks, the improvement comprising blocks arrangeable into a variable mosiac pattern which forms said surface covering, the pattern being characterized by visual randomness and a random decorative effect, the blocks having arcuate edges and at least three different highly irregular shapes with no perpendicular axes of symmetry, the blocks being contiguously associable into one or more groups wherein at least one group of contiguous blocks is interchangeable with one or a plurality of other adjacent groups so as to create an appearance of visual randomnesss and avoid a recognizable appearance of repetitiveness or symmetry, the number of different highly irregular shapes being less than about 20, and each of said shapes having at least one cusp.

4,217,741
METAL ROOF PANEL STRUCTURE
Randall L. Cole, P.O. Box 74, Tell City, Ind. 47586
Filed Sep. 12, 1978, Ser. No. 941,384
Int. Cl.[2] E04D *1/06*
U.S. Cl. 52—520 **4 Claims**



1. A metal roof panel structure comprising a first panel, a

second panel, and a roof clip interconnecting said first panel and said second panel, said first panel and said second panel each having an end portion extending upwardly, downwardly and outwardly and an opposite end portion extending upwardly, downwardly and inwardly, said first panel and said second panel each having an upwardly extending hollow portion at the mid-area thereof, and said roof clip having one end sandwiched between contiguous end portions of said first panel and said second panel which overlie in the same direction and hooking over the end portion of one of said panels to define a multi-layered overlapping assembled seam and an opposite end which extends into said upwardly extending hollow portion of a panel, where the seam between said first panel and said second panel including said one end of said roof clip is crimped and where said upwardly extending hollow portion of a panel including said opposite end of said roof clip is crimped, all in a watertight relationship.

4,217,742

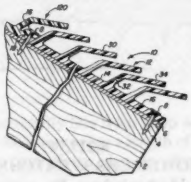
ROOF LOUVER APPARATUS

Daniel D. Evans, 5829 N. 17th Pl., Phoenix, Ariz. 85016

Filed Mar. 16, 1978, Ser. No. 886,995

Int. Cl.[2] E04D *1/00*

U.S. Cl. 52—553 **5 Claims**



1. Roof panel apparatus for providing shade for a pitched roof, comprising, in combination:

a pitched roof;

base means secured to the pitched roof;

louver means secured to the base means and comprising a plurality of generally horizontally extending rows of louvers spaced apart from each other, and each louver includes

a first portion secured to the base means and extending outwardly therefrom;

a second portion secured to the first portion and extending over part of an adjacent lower louver but spaced therefrom to provide a shaded pocket of air above the adjacent lower louver and the roof.

4,217,743

APPARATUS FOR PROCESSING DEVELOPED PHOTOGRAPHIC FILMS AND PRINTS

Eberhard Escales, Munich; August Hell, Feldkirchen; Andreas Schubert, Munich, and Klaus Weber, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

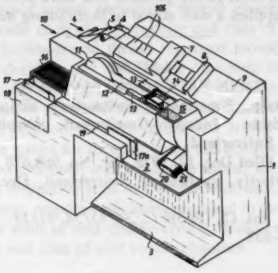
Filed Jun. 2, 1978, Ser. No. 912,056

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724863

Int. Cl.[2] B65B *57/14, 61/06*

U.S. Cl. 53—54 **16 Claims**

1. Apparatus for processing webs of exposed and developed customer films and webs of photosensitive material including prints of the images of film frames of customer films, comprising first severing means for severing the webs of successive customer films so that each film yields a set of sections; second severing means for severing the webs of photosensitive material so that such webs yield discrete prints; means for collating sets of film sections and the related prints to form assemblies each including a set of film sections and the related prints, said collating means including means for delivering successive assemblies to a first location; a magazine for empty pockets bearing information which identifies the corresponding customer films; and means for transporting successive empty pockets from said magazine to a second location, said first and



second locations being respectively within reach of one hand and the other hand of an attendant in charge of introducing successively formed assemblies into successive pockets which are transported to said second location.

4,217,744

PACKAGING MACHINE

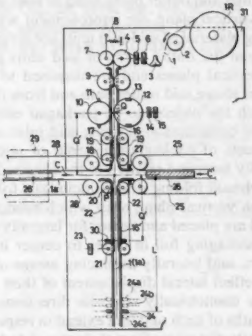
Shigemitsu Mizutani, Nakanuma Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 26, 1979, Ser. No. 14,788

Claims priority, application Japan, Feb. 24, 1978, 53-20580

Int. Cl.[2] B65B *57/04, 57/12*

U.S. Cl. 53—55 **9 Claims**



1. A packaging machine in which a belt-shaped packaging sheet is fed continuously by feeding means and cut to a predetermined length by cutting means while being guided and conveyed in a direction intersecting a conveyance direction of articles to be packaged, and said packaging sheet is folded to package each article as said article is conveyed, the improvement comprising:

(a) first position detector means for detecting the arrival of the top end of said packaging sheet, said sheet being guided and conveyed in the direction intersecting the conveyance direction of said articles, at a predetermined feeding limit position, said first position detector means generating a stop signal to said feeding means;

(b) second position detector means for detecting the arrival of each article at a position disposed immediately upstream of intersection position where said article crosses said packaging sheet said second position detector means applying a start signal to said feeding means; and

(c) third position detector means for detecting the arrival of

the top end of said packaging sheet returned from said feeding limit position by being moved as said article abuts against said packaging sheet and wherein as said top edge of said packaging sheet is further conveyed, to a predetermined reverse return position said third position detector means applies a start signal to said cutting means.

4,217,745

TWIN PACKAGING MACHINE

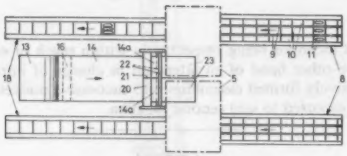
Roland Watzka, Feuerthalen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Dec. 12, 1978, Ser. No. 968,678

Claims priority, application Switzerland, Dec. 29, 1977, 16208/77

Int. Cl.[3] **B65B** *11/22, 35/54, 41/14*

U.S. Cl. 53—531 **5 Claims**



1. In a twin packaging machine composed of two packaging units, each including a folding device, an inlet path for feeding objects to be packaged to said device, means storing a sheet of packaging material, means for cutting successive packaging foils from the sheet, and a substantially horizontally extending outlet path for the finished packages, the central longitudinal axes of the inlet and outlet paths lying at least approximately in a common vertical plane, the improvement wherein the sheets of packaging material of said two units are arranged in juxtaposition between the outlet paths of said units in a plane other than said vertical planes and are disposed to enter into said devices from above said outlet path and from the side opposite that at which the objects to be packaged enter said devices, said machine comprises a support, said inlet and outlet paths and said sheets of packaging material of said two units are symmetrically arranged relative to the longitudinal axis of said support, each said folding device includes a folding plunger in said common vertical plane onto which successive objects to be packaged are placed and means for laterally displacing each associated packaging foil in order to center it above each of said plungers, said laterally displacing means of said two folding devices effect lateral displacement of their associated foils in respective diametrically opposite directions, and said inlet and outlet paths of each said unit extend in respectively diametrically opposite directions from their associated folding device.

4,217,746

CROP DEFLECTOR

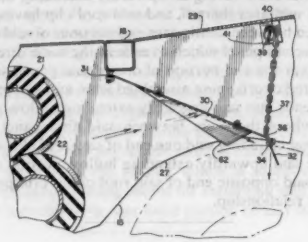
George B. Cicci, Burr Ridge; Leo A. Markert, Alsip; George W. Ridge, La Grange, and Austin W. Lutz, Jr., Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 10, 1979, Ser. No. 37,990

Int. Cl.[3] **A01D** *57/26*

U.S. Cl. 56—14.4 **8 Claims**

1. A hay harvesting machine of the type including a frame, a transversely elongated crop cutting apparatus disposed forwardly on said frame, a pair of transverse outer counterrotating hay conditioning rolls disposed on said frame rearwardly of said cutting apparatus, said rolls being closely spaced for receiving cut crop therebetween and propelling it in a rearwardly directed airborne stream, windrowing means disposed rearwardly of said conditioning rolls for receiving said airborne stream and effecting a lateral consolidation thereof for deposit on the ground in a windrow, a transversely extending crop deflecting baffle mounted to said frame rearwardly of said rolls and having a first position located generally above said airborne stream thereby permitting substantial consolidation by said windrowing means and a second position intercepting



said stream and deflecting it downwardly for deposit in a swath, and deflector vanes disposed on the laterally intermediate portions of said baffle, said vanes being disposed at an angle to the crop stream to deflect crops toward the center of said stream.

4,217,747

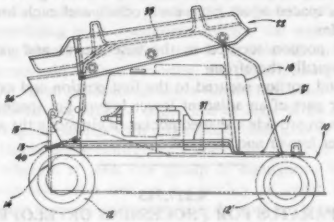
LAWN MOWER GRASS CATCHER ASSEMBLY

Thomas Brown, Mechanicsburg, Pa., assignor to The Perfection Manufacturing Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 817,716, Jul. 21, 1977, Pat. No. 4,151,702. This application Feb. 5, 1979, Ser. No. 9,153

Int. Cl.[2] **A01D** *35/22*

U.S. Cl. 56—203 **5 Claims**



1. In a lawn mower and rigid grass catcher assembly:

(a) a lawn mower including:

1. a housing having an upper deck portion,
2. a motor assembly projecting above said upper deck portion, and

(b) a rigid grass catcher operatively mountable to the lawn mower in a first disposition of parts in a grass catching mode, and operatively mountable to the lawn mower in a second disposition of parts in a storage mode, said catcher including:

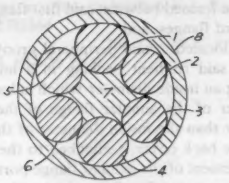
1. a first hollow body section having a depth at least substantially equal to the height of the motor assembly and receivable over the motor assembly to provide a hood therefor in the storage mode, and
2. a second hollow body section having a shallower depth than said first body section and receivable in nested relation over said first body portion in the storage mode.

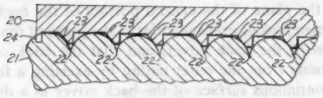
4,217,748

SAFE WIRE ROPE

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison, Montreal, Quebec, Canada (H3R 1K3)

Filed Aug. 3, 1979, Ser. No. 63,454
Int. Cl.[3] D07B *1/16*
U.S. Cl. 57—212 4 Claims





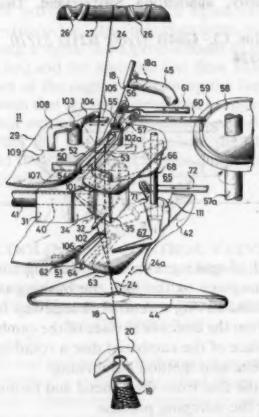
1. A wire rope substantially free from whip when stressed to the breaking point, which comprises a length of wire rope with a plurality of strong, hard elastic sleeves which encircle and compress said rope.

4,217,749

METHOD AND APPARATUS FOR JOINING TEXTILE THREADS

Joachim Rohner; Reinhard Mauries, and Heinz Zümfeld, all of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 14, 1978, Ser. No. 960,635
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1977, 2750913
Int. Cl.[2] D01H *15/00*
U.S. Cl. 57—261 10 Claims



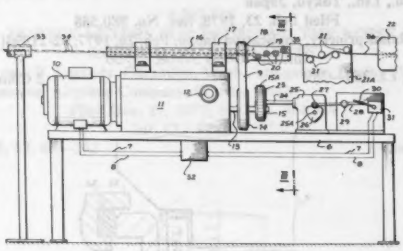
3. Apparatus for performing a method of joining textile threads comprising a vortex chamber formed with a cylindrical inner space, an elongated slot through which the textile threads to be joined are insertable into the inner space of the vortex chamber and a channel terminating tangentially at said cylindrical inner space for supplying compressed air thereto, said vortex chamber having end rims at opposite ends of the cylindrical inner space, respective thread clamping devices disposed outside each of the opposite end rims of said vortex chamber, a double-armed thread regulator movable between said vortex chamber and said thread clamping devices automatically from a starting position to an end position and from the latter position to an intermediate position and back again to said starting position so as to intersect a travel path of the threads to be joined for forming loops thereof at said end rims of said vortex chamber; and respective thread severing means for severing respective ends of the textile threads, said thread severing means, respectively, being disposed in the travel path between the arms of said double-armed thread regulator and both of said end rims of said vortex chamber.

4,217,750

MACHINE FOR TWISTING WIRE STRANDS OF ELECTRIC CABLES

Bruce W. Hills, 4 The Point Rd., Woolwich, New South Wales 2110, Australia

Filed Oct. 20, 1978, Ser. No. 952,946
Claims priority, application Australia, Oct. 21, 1977, PD2151
Int. Cl.[3] H01B *13/02;* D02G *1/06*
U.S. Cl. 57—293 5 Claims

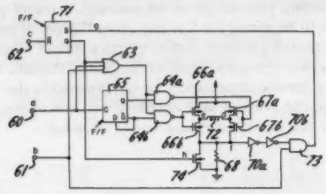


1. A bunching machine for producing from plural wires drawn along a path through said machine a power cable composed of plural twisted wires within an insulating casing, said machine comprising a tubular sleeve rotatable in bearings and surrounding part of said path; a twisting head on said sleeve including in said path a series of transversely disposed gripping rollers between which said path extends; stationary take-off means including in said path a series of transversely disposed twist retaining means for retaining the twist in the wires between which means said path extends whereby twisting together of said wires occurs between said head and said take-off means upon rotation of said sleeve; a reversible motor for rotating said sleeve in alternating directions to impart alternate sections of oppositely handed twists to the cable produced; a rotatable cam; driving means coupling said cam to said reversible motor; an electrical reversing switch controlling said motor operated by said cam to determine the degree of twist in each said section of said cable and a plastics coating machine in said path beyond said take-off means.

4,217,751
ELECTRONIC TIMEPIECE

Akira Torisawa; Makoto Ueda; Kazuhiro Asano; Katsuhiko Satoh; Masaaki Mandai, and Masaharu Shida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,438
Claims priority, application Japan, Apr. 23, 1977, 52-47091
Int. Cl.[2] G04C *3/00*
U.S. Cl. 368—76 **5 Claims**

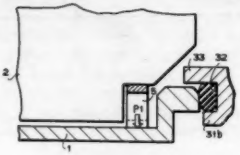


1. An electronic timepiece comprising: a stepping motor; an oscillating circuit for producing a time base signal, a dividing circuit for dividing down the time base signal; a drive circuit for driving the stepping motor including a power source, a pair of two series-connected driving transistors, a resistance element for limiting current from the power source and a transistor connected in parallel with the resistance element for short-circuiting same; means for comparing the voltage across the resistance element with a predetermined voltage to control the short-circuiting transistor to short circuit the resistance element when a favorable comparison is made indicating non-rotation of the motor.

4,217,752
FIXING STRUCTURE OF BACK COVER FOR WATCH

Osamu Matsumura, Chofu, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,588
Claims priority, application Japan, Feb. 25, 1977, 52-21994[U]
Int. Cl.[2] G04B *37/08, 37/00*
U.S. Cl. 368—289 **2 Claims**

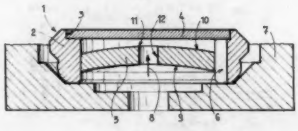


1. A fixing structure of a back cover of a watch comprising:
(a) an outer casing for accommodating a watch movement therein and provided with an opening at the bottom thereof;
(b) a back cover having a generally planar central portion and an annular flange portion surrounding said central portion and situated in a plane axially offset with respect to said central portion in a direction towards the top of said outer casing, the axial offset between said central portion and said flange portion defining a continuous surface on the exterior of the back cover which forms an angle with the plane of said central portion which is less than or equal to 90°;
(c) a first flange formed on said outer casing at an inner side of said opening with respect to the casing interior, said first flange having a diameter smaller than the diameter of the outer periphery of the flange portion of said back cover;
(d) a second, arcuate flange and a third, arcuate flange coplanar with each other and formed on said outer casing at an outer side of said opening with respect to the casing interior, said second flange having a circular shape with a diameter greater than the diameter of the outer periphery of the annular flange portion of said back cover and said third flange having a circular shape with a diameter smaller than the diameter of the outer periphery of the annular flange portion of said back cover;
(e) a peripheral groove formed between said first flange and said second and third flanges; and
(f) a resilient packing located in said peripheral groove, the inside diameter of said resilient packing in a noncompressed state having an inside diameter which is less than the outside diameter of the annular flange of the back cover and is greater than the inside diameter of the first flange; such that the back cover is attached to the outer casing by the engagement of the annular flange portion of the back cover between said first flange and said second and third flanges; and such that when the back cover is so attached the resilient packing is compressed by the outer periphery of the annular flange portion of the back cover in a direction having at least a component in a plane parallel to the plane of the central portion of the back cover and a component perpendicular to the plane of the central portion of the back cover, and that the back cover is removable from the outer casing by exerting a force on said continuous surface of the back cover in a direction having at least a component in a plane parallel to the plane of the central portion of the back cover.

4,217,753
METHOD FOR THE MANUFACTURING OF A METALLIC BUSHING FOR A BEARING OF TIMEPIECES AND OF SMALL MECHANICS AND BUSHING OBTAINED BY CARRYING OUT THIS METHOD

Edouard Loretan, Le Sentier, Switzerland, assignor to Kif-Parechoc S.A., Vaud, Switzerland

Filed Dec. 18, 1978, Ser. No. 970,157
Claims priority, application Switzerland, Dec. 20, 1977, 15721/77
Int. Cl.[2] G04B *31/00;* **B21D** *53/10*
U.S. Cl. 368—324 **5 Claims**



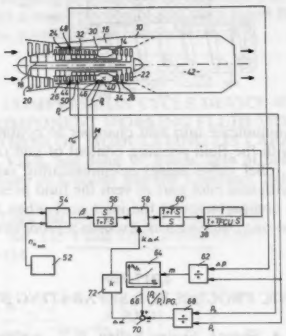
1. A method of making a metallic bushing for use as the bearing of a timepiece or the like, the bushing comprising a thin cambered disc having a central passageway for receiving in a direction from the concave surface of the cambered disc to the convex surface of the cambered disc a rotating shaft to be journalled therein, said method comprising:
A. stamping the disc from sheet metal and forming the camber during the stamping process;
B. piercing the passageway by stamping in a direction from the concave surface of the disc to the convex surface of the disc so that any burr formed will be formed on the convex surface; and
C. tumbling the disc in a polishing drum to remove the burr.

4,217,754

APPARATUS FOR CONTROLLING THE ROTARY SPEED IN TURBO-JET ENGINES FOR AIRCRAFT

Heiner Schmidt-Roedenbeck; Peter Wüst, both of Überlingen, and Wilfried Wellern, Uhldingen-Mühlhofen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Continuation of Ser. No. 853,350, Nov. 21, 1977, abandoned.
This application Jun. 14, 1979, Ser. No. 48,690
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702564
Int. Cl.[3] F02C 9/04
U.S. Cl. 60—39.28 R 3 Claims



3. Apparatus for the control of acceleration processes in aircraft gas turbine engines of the type having a compressor (32) operating in front of a combustion chamber (36) and a turbine (34) operating behind the combustion chamber (36), and having a fuel control unit (38) for supplying a fuel flow rate (M) to the combustion chamber (36), the apparatus comprising means (46, 44, 68) for measuring the actual ratio of pressures (p_2, p_1) at the outlet and the inlet of the compressor (32) and providing output signal values (p_2/p_1) indicative thereof, means (70) for comparing the actual measured compressor pressure ratio signal values (p_2/p_1) with predetermined pressure ratio signal values $(p_2/p_1)_{PG}$ for an operating range of the engine, which predetermined pressure ratio signal values are set below the ratio level signal value (surge line) corresponding to compressor surge over the operating range of the engine, and for providing a difference signal value surge line distance $(\Delta\alpha=(p_2/p_1)_{PG}-(p_2/p_1))$ therefrom, and means (56, 58, 60) receiving a signal ($k\Delta\alpha$)proportional to said difference signal value ($\Delta\alpha$) and the metered fuel flow value (B) from a speed governor of the engine for limiting the fuel flow during acceleration such that said predetermined pressure ratio signals (surge line limit curve) are not exceeded, said limiting means including means (56, 58, 60) for limiting the time derivative (M) of the fuel flow rate (M) to a value ($k\Delta\alpha$) proportional to said difference signal value ($\Delta\alpha$).

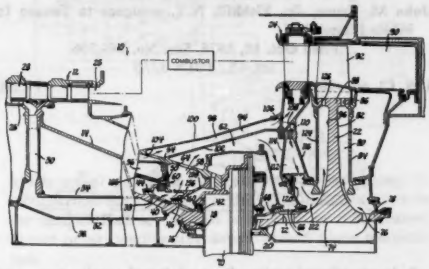
4,217,755

COOLING AIR CONTROL VALVE

James R. Williams, Martinsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 4, 1978, Ser. No. 966,068
Int. Cl.[3] F02C 7/18
U.S. Cl. 60—39.75 2 Claims

1. A turbine seal and coolant fuel control assembly for use in gas turbines having a coolant air bleed from a compressor discharge stage comprising: an inter-stage seal including a stator member with an annular seal surface thereon, a rotatable turbine component including a movable labyrinth seal thereon engageable with said annular seal surface to define a pressure seal, a leaf spring member including an end thereon fixedly secured to said stator member and further including a valving element thereon, a valve seat located in spaced relationship to said valving element, an annular member with axially spaced ends secured between said stator member and said leaf spring member to produce a bias thereon for moving said valving element into a spaced relationship with said valve seat to define an open flow path to said rotatable turbine component for controlling coolant air flow thereto, means including said annular member to define a pressurizable chamber between said fixed member and said leaf spring member and including means communicating with compressor discharge pressure to



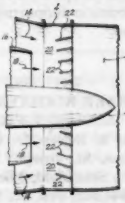
produce a differential pressure across said leaf spring member to bias it against the spring force of said annular member to produce sealing engagement between said valving element and said valve seat, and means to communicate said pressurizable chamber with atmosphere in response to increases in temperature of said turbine component to cause said valving element to cycle open and closed with respect to said valve seat in response to temperature conditions of said turbine component to modulate flow of cooling air to said turbine component under engine cruise conditions thereby to avoid excessive bypass of total engine air flow for cooling said turbine component.

4,217,756

VORTEX MIXERS FOR REDUCING THE NOISE EMITTED BY JET ENGINES

Jerome R. Laskody, Carnation, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Dec. 27, 1977, Ser. No. 864,564
Int. Cl.[2] F02K 3/02
U.S. Cl. 60—262 8 Claims



1. In a turbofan engine having an annular fan fluid flow exhaust passageway located between an outer engine cowling and a splitter wall structure, said splitter wall structure terminating at a distance upstream of the nozzle exit plane of said engine, an annular primary fluid flow exhaust passageway located inside of said splitter wall structure, and a tail plug disposed in mid engine upstream of the nozzle exit plane and extending downstream past the end of said splitter wall structure, apparatus for internal mixing of fan exhaust flow with primary exhaust flow upstream of the nozzle exit plane of said engine and downstream of the end of said splitter wall structure, comprising:

a plurality of struts disposed radially between the engine tail plug and the outer engine cowling upstream of the nozzle exit plane; and

a plurality of vortex generating means disposed at radially spaced locations on each of said struts for generating vortices across the entire engine exhaust area to promote mixing of said fan and primary exhaust flows to reduce noise.

4,217,757

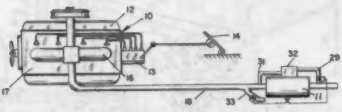
EXHAUST GAS RECYCLING SYSTEM

John M. Crone, Jr., Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,706

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—288 **7 Claims**



1. In an exhaust system for an internal combustion engine which burns a hydrocarbon fuel mixture, and which produces a carbonaceous particle carrying hot exhaust gas stream, having a combustion supporting constituent,

a filter having a bed therein, through which the exhaust gas stream is passed whereby carbonaceous particles carried on said stream will be retained in the bed,

said filter having an inlet port communicated with said internal combustion engine to receive said hot exhaust gas stream therefrom, and having an outlet port at the downstream side of said bed to conduct particle-free gas from the latter, and

flow control means located at a point upstream of said filter inlet port, and being operable to regulate the flow rate of hot exhaust gas which contacts carbonaceous particles retained on said bed to avoid the establishment of excessive temperatures with the particle retaining bed caused by combustion of the particles, and

valved bypass means communicating said filter exhaust port with said filter inlet port to circulate a minor stream of particle-free gas from the outlet port to the inlet port,

whereby to mix said minor stream with the stream of exhaust gas received from said internal combustion engine, thereby to form a composite stream and thus reduce the amount of combustion supporting constituent which enters the filter bed.

4,217,758

HYDRAULIC BRAKE BOOSTER WITH INTEGRAL ACCUMULATOR

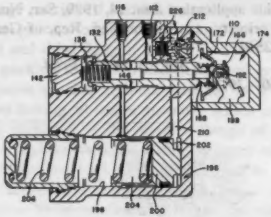
Lloyd G. Bach; Arthur K. Brown, Jr., both of South Bend, Ind., and George M. Tam, St. Joseph, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 444,925, Feb. 22, 1974, Pat. No. 4,154,059, which is a continuation-in-part of Ser. No. 317,892, Dec. 26, 1972, abandoned. This application Nov. 20, 1978, Ser. No. 962,275

Int. Cl.[2] F15B *1/02, 13/10*

U.S. Cl. 60—404 **10 Claims**

1. In a hydraulic booster; a housing having an inlet port communicated to a fluid pressure source and a return port communicated with a reservoir, said housing defining a pressure chamber and a bore therewithin; first valve means actuated by the booster operator for controlling fluid communication between said inlet and return ports and said pressure chamber; a piston slidably mounted in said bore and defining compartments between opposite ends of the piston and corresponding ends of the bore, resilient means yieldably urging said piston into one of said compartments, relief valve means for venting said one compartment when the fluid pressure in said one compartment attains a predetermined level, and means for diverting a portion of the fluid communicated to said inlet port into said one compartment; and second valve means responsive to actuation of said first valve means and failure of fluid pressure to communicate into said chamber to communicate said chamber with the fluid pressure content of said one compartment; said relief valve means communicating said one compartment with said inlet port to vent the fluid pressure content of the one compartment to the inlet port when the pressure level in said one compartment exceeds a predetermined level.



4,217,759

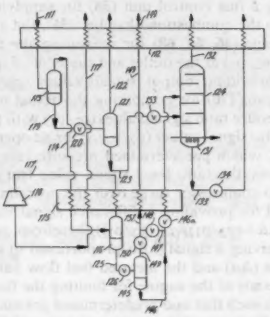
CRYOGENIC PROCESS FOR SEPARATING SYNTHESIS GAS

Thirtahalli A. Shenoy, Spring Valley, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1979, Ser. No. 24,598

Int. Cl.[2] F25J *3/02*

U.S. Cl. 62—27 **10 Claims**



1. In the cryogenic separation of a gas mixture comprising hydrogen, carbon monoxide and methane by partial condensation in which the feed gas mixture is provided at super atmospheric pressure above about 300 psia and partially cooled to condense a first liquid fraction and recover a first gas fraction, the first liquid fraction is separated into a carbon monoxide product gas and methane product liquid, the first gas fraction is further cooled for additional partial condensation and separated into a hydrogen enriched gas fraction and a second carbon monoxide rich liquid, the improvement comprising:

(a) treating said first liquid fraction so as to provide a carbon monoxide rich liquid feed for the carbon monoxide-methane separation; (b) further cooling the first gas fraction at about said super atmospheric pressure for said additional partial condensation and separating the same into a second liquid fraction and a second gas fraction as said hydrogen enriched gas; (c) rewarming said second gas fraction as said hydrogen enriched gas fraction by heat exchange initially with the further cooling first gas frac-

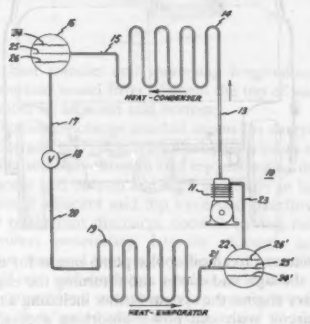
tion and thereafter with the partially cooling feed gas mixture; (d) expanding said second liquid fraction to lower pressure between 20 psia and 130 psia, and separating the same into a third liquid fraction and a third gas fraction; (e) providing said third gas fraction at low super atmospheric pressure below about 50 psia; (f) providing a minor portion of a carbon monoxide rich liquid obtained from the cooled feed gas mixture after further cooling, at said low super atmospheric pressure of step (e) and combining the so-provided minor portion with the third gas fraction of (e) to form a recycle gas mixture; (g) rewarming said recycle gas mixture by heat exchange initially with the further cooling first gas fraction and thereafter with the partially cooling feed gas mixture; and (h) flowing at least a major portion of said third liquid fraction to the carbon monoxide-methane separation.

4,217,760

VAPOR COMPRESSION CYCLE DEVICE WITH MULTI-COMPONENT WORKING FLUID MIXTURE AND METHOD OF MODULATING ITS CAPACITY

Himanshu B. Vakil, and John W. Flock, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,510
Int. Cl.[2] F25B *1/00, 41/00, 43/00*
U.S. Cl. 62—114 **4 Claims**



1. A method of modulating the capacity of a vapor compression cycle device which comprises compressing a multi-component working fluid mixture, condensing the mixture vapor, storing the mixture liquid under high pressure, controlling the flow rate of the mixture from storage, evaporating the mixture, storing the unevaporated mixture under low pressure, and controlling the flow rate of compression by the density of the mixture under low pressure.

4,217,761

HEAT PUMP OUTPUT INDICATOR

James L. Cornaire, 13 Marilyn Dr., Scotia, N.Y. 12302, and Phillip R. Crabbs, Hubbs Rd., R.D. #6, Ballston Lake, N.Y. 12019

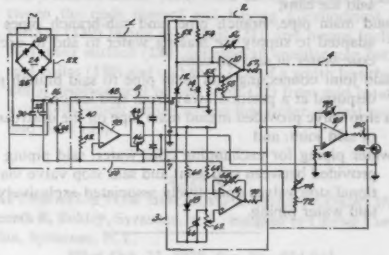
Filed Sep. 28, 1978, Ser. No. 947,158
Int. Cl.[2] G01K *13/00;* G05D *23/00*
U.S. Cl. 62—130 **18 Claims**

1. A device for measuring the operating efficiency relative to its design efficiency at a given outdoor temperature, said heat pump or refrigeration device or air conditioning device having a supply air stream, a return air stream, an indoor coil, and a design efficiency which varies according to the outdoor temperature, comprising:

first means for generating a first output having a characteristic which is proportional to the air temperature difference across said indoor coil;

second means for generating a second output having a characteristic which increases and decreases in proportion to changes in the outdoor temperature; and

means connected to said first and second generating means, for combining said first and second outputs to generate a third output having a characteristic directly proportional



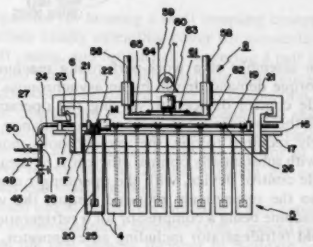
to the actual operating efficiency of said heat pump or refrigeration device or air conditioning device relative to the design efficiency of said heat pump or refrigeration device or air conditioning device at said given temperature.

4,217,762

ICE MAKING EQUIPMENT

Shigeru Sakamoto, Tokyo; Hiroyuki Moriyama, Mitaka; Ryosuke Fujii, Higashimurayama; Toshiharu Ishii, Yokohama; Isao Sugawara, Urawa, and Minoru Kikuchi, Chiba, all of Japan, assignors to Taisei Corporation, Tokyo, Japan

Filed Jan. 24, 1979, Ser. No. 5,971
Claims priority, application Japan, Sep. 8, 1978, 53-110316
Int. Cl.[2] F25C *1/18*
U.S. Cl. 62—132 **25 Claims**



21. Ice making equipment, comprising:

a plurality of ice cans each provided with lugs for lifting said ice cans, said ice cans being placed in alignment in at least one ice tank in such a manner that said lugs are aligned with regular spaces therebetween;

said ice tank(s) being disposed in an ice-making area;

actuating means including a branch pipe, said branch pipe being mounted on each said ice can;

separately-installed means for supplying air and for supplying and treating ice making water and including a main pipe, said branch pipe being adapted to be detachably connected by means of a joint to said main pipe;

cover lids adapted to cover said ice cans;

an ice stripping-off area provided with means for stripping-off ice blocks formed within said ice cans;

a pair of rails extending between said ice-making area and said ice stripping-off area;

an overhead travelling crane comprising a trolley adapted to travel on said rails;

at least two pairs of guide rods suspended from said trolley;

at least one hook device adapted to be lifted up or lowered

down while being guided by said guide rods to permit said crane to lift up and transfer said ice cans together with said cover lid by upwardly engaging with said lugs;

a plurality of sub-branch pipes branched and suspended from said branch pipe toward the lower center of each said ice can for supplying water and for exchanging core water in said ice cans;

said main pipe, branch pipe, and sub-branch pipes being adapted to supply ice making water to and to exchange core water in said ice cans;

said joint connecting said main pipe to said branch pipe is disposed at a position away from said ice cans;

a stop valve provided in said main pipe on the upstream side of said joint; and

water piping for exchanging core water, said piping being provided between said joint and said stop valve via additional stop valves operatively associated exclusively with said water piping.

4,217,763

ASYNCHRONOUS MOTOR-DRIVEN MACHINE HAVING VARIABLE TORQUE DEMAND, SUCH AS HOUSEHOLD REFRIGERATOR COMPRESSORS

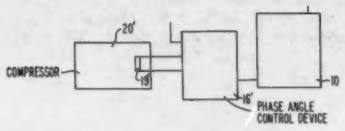
Karl Hammele, and Henno Schotten, both of Giengen, Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 786,383

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615768

Int. Cl.[2] **F25B** *31/00;* **H02K** *17/02*

U.S. Cl. 62—227 **2 Claims**



1. In an assembly of a work-performing machine having variable torque demand driven by an asynchronous motor, a phase-angle control device for varying the operating r.m.s. voltage of the asynchronous motor in accordance with the respectively required torque, the asynchronous motor being operable with substantially optimal efficiency, by means of said phase angle control device, with the operating r.m.s. voltage matched to the respectively required torque, the work-performing machine being a compressor for a refrigeration unit of a household refridegerator including an evaporator, and said means for varying the operating r.m.s. voltage of the asynchronous motor for varying the torque demanded by the work-performing machine being effective in accordance with the respective temperature of the evaporator of the refrigeration unit.

4,217,764

ROOF MOUNTED MOTOR VEHICLE AIR CONDITIONER

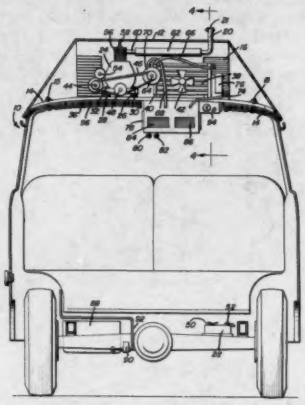
Joseph M. Armbruster, Lighthouse Point, Fla., assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Jul. 5, 1978, Ser. No. 922,365

Int. Cl.[3] **F25B** *27/00;* **B60H** *3/04*

U.S. Cl. 62—323 **8 Claims**

1. An air conditioning system for a motor vehicle, said vehicle having a generally horizontal roof, comprising a condenser, a compressor, an auxiliary internal combustion engine, and an evaporator, said condenser, compressor and engine being attached atop a chassis mounted upon said roof, said evaporator being attached to the bottom side of said chassis and depending through an opening in said roof into the interior of said vehicle, the vehicle having a primary internal combustion engine powered by gasoline stored in a vehicle fuel tank, the auxiliary internal combustion engine of said air conditioning system being powered from fuel stored in said vehicle fuel tank, said fuel tank having appended thereto an auxiliary fuel pump, said fuel pump being connected to said auxiliary internal combustion engine by a fuel line, the system further including an alternator electrically connected to an auxiliary electric storage battery, said alternator being powered by said auxiliary internal combustion engine, and said battery having power-absorbing accessories switchably in circuit therewith, the system further including an electric starter motor mechanically engageable with said auxiliary internal combustion engine and electrically connected to said auxiliary electric storage battery, wherein said air conditioning system is encased in a streamlined protective fiberglass cowling attached to said chassis by a turn-operated fastener, the system having a layer of rubber insulation between said chassis and said roof, wherein said auxiliary engine is oil lubricated and is connected to an oil



cooler connected to an oil cooler pump means for circulating engine oil through said cooler and returning the engine oil to said auxiliary engine, the system further including a time delay relay in circuit with said power-absorbing accessories, said time delay relay preventing electrical connection of said power-absorbing accessories to said battery until passage of a predetermined time after said starter motor starts the auxiliary engine, wherein said fuel pump is electrically powered, and is connected to a heat-sensing device adapted to electrically disconnect said fuel pump when said heat-sensing device reaches a predetermined temperature, the battery having in association therewith a voltage regulator to permit charging and maintenance of a proper charge thereof, the cowling being provided with an air inlet comprising a louvered assembly having slots for entry of air into said cowling while excluding entry of rain or objects from the outside, and the auxiliary internal combustion engine being mounted with its driven shaft horizontal for driving said compressor.

4,217,765

HEAT EXCHANGER-ACCUMULATOR

Amir L. Ecker, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 4, 1979, Ser. No. 45,392

Int. Cl.[2] **F25B** *43/00*

U.S. Cl. 62—503 **6 Claims**

1. A heat exchanger-accumulator for vaporizing a refrigerant or the like, comprising:

a. an upright, pressure vessel having top, bottom, and side walls;

b. an inlet conduit eccentrically and sealingly penetrating through said top so as to discharge said refrigerant down-

wardly along said side wall of said pressurized vessel when refrigerant flows through said inlet conduit;

c. a tubular overflow chamber disposed within said vessel and sealingly connected with said bottom so as to define also an annular outer volumetric chamber for receiving said refrigerant such that liquid refrigerant will settle toward the bottom, being isolated from the liquid in said outer volumetric chamber until said liquid overflows the top of said overflow chamber;

d. a heat transfer coil disposed in said annular outer volumetric chamber for vaporizing liquid said refrigerant; said heat transfer coil comprising a coil defining a passageway for heat exchange fluid and having means for transferring heat efficiently from said fluid to said refrigerant and freely allowing vaporized refrigerant to escape upwardly from the liquid said refrigerant; said coil having inlet and outlet conduit means for conducting said fluid and penetrating laterally through said walls of said pressure vessel;

said heat transfer coil traversing longitudinally of said pressurized vessel from adjacent the top of said overflow chamber to adjacent said bottom;

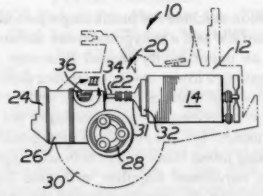
e. refrigerant discharge conduit means for carrying effluent refrigerant; said refrigerant discharge conduit means penetrating sealingly through said top, extending downwardly adjacent said bottom and back upwardly to have its inlet disposed adjacent said top have said overflow chamber; said refrigerant discharge conduit having metering passageways penetrating laterally through said conduit means near said bottom for allowing a controlled flow of liquid into said discharge conduit, at least one said metering passageway communicating interiorly of said overflow chamber adjacent its bottom and at least one said metering passageway communicating with said annular outer volumetric chamber adjacent its bottom; said metering passageways serving to controllable carry small amounts of a liquid refrigerant and oil that may accumulate into the effluent stream of refrigerant gas.

4,217,766

SHAFT VIBRATION DAMPER

David S. Suckow, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 31, 1978, Ser. No. 938,731
Int. Cl.³ F16C *3/00*
U.S. Cl. 64—1 V **8 Claims**



1. In a shaft supporting apparatus **(24, 32,36)** wherein a shaft **(22)** having a first order critical speed is supported at both ends **(35,56)** thereof by spaced support means **(24,32)** for rotation about an axis **(140)** corresponding to the centerline **(140)** of said shaft **(22)**, said ends **(35,56)** being fixed against radial displacement by said support means **(24,32)**, the improvement comprising:

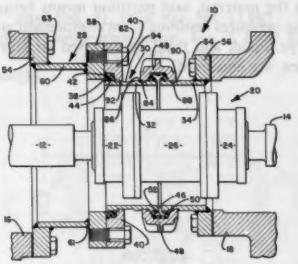
a non-yieldable collar **(120)** fixed about said shaft **(22)** between the ends thereof and having a cylindrical inner surface **(130)** facing said shaft **(22)**, and means including said inner surface **(130)** defining an annular gap between said collar **(120)** and said shaft **(22)** of a width less than the radial displacement of said shaft **(22)** from said rotational axis **(140)** which occurs at said first order critical speed of said shaft **(22)**.

4,217,767

APPARATUS FOR HOUSING A SHAFT COUPLING

Kenneth E. Eckley, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,043
Int. Cl.² F16D *3/84*
U.S. Cl. 64—32 R **3 Claims**



1. Apparatus for housing a shaft coupling comprising:

an outside axially extending cover for connection to a first shaft casing, and for partially covering a pair of generally aligned shafts and a shaft coupling connecting the shafts;

an inside axially extending cover for connection to a second shaft casing, and for further covering the shafts and the shaft coupling, where the inside cover is radially spaced from and axially slidable into the interior of the outside cover to produce an annular opening for access to the shafts and shaft coupling;

a selected one of the covers including a first annular member and a second annular member axially spaced and separable from the first annular member to facilitate covering the shafts;

a radial seal for sealing the radial space between the inside and outside covers; and

an axial seal for sealing the axial space between the first and second annular members.

4,217,768

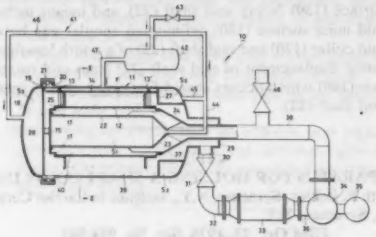
DYEING APPARATUS

Isao Sugimoto, Aichi, Japan, assignor to Nippon Dyeing Machine Mfg. Co., Ltd., Ama and Yoshida Kogyo K.K., Tokyo, both of, Japan

Filed Nov. 2, 1978, Ser. No. 957,181
Claims priority, application Japan, Nov. 14, 1977, 52-135672
Int. Cl.³ D06B *5/18, 21/02*
U.S. Cl. 68—20 **4 Claims**

4. In a dyeing apparatus having a containment vessel in which material to be dyed is supported for contact with a dye liquid introduced into the vessel, and partition means defines within said vessel at least one enclosed hollow space, said partition means excluding the dye liquid from the volume of said hollow space to reduce by a corresponding volume the amount of dye liquid required to fill the remaining volume of

the vessel, the improvement which comprises conduit means flow connected with said vessel and with a source of compressed air to introduce into said vessel compressed air to contact said material after dyeing thereof to drive off liquid therefrom, said conduit means communicating with said hol-



low space to introduce therein compressed air for storage thereby and subsequent release therefrom to drive off the dye liquid from the material, said partition means being disposed such that the pressures resulting from compressed air acting to drive off dye liquid, and from compressed air stored in said hollow space, are equalized.

4,217,769

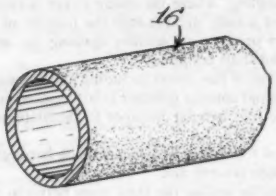
METHOD OF FORMING A COATING APPLICATION ROLL

Wayne A. Damrau, Wisconsin Rapids, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Oct. 10, 1978, Ser. No. 950,134

Int. Cl.³ C21D 7/06

U.S. Cl. 72—53 **2 Claims**



1. A method of making a coater dip roll for use directly adjacent a moving paper web, consisting of the steps of:

selecting a cylinder made of a corrosion resistant material;

providing said cylinder with an initial outer surface finish of substantially 16 microinches RMS;

shot blasting the outer surface of said cylinder with steel shot 0.030 to 0.060 inches in diameter and having a hardness of 40 Rockwell C or greater;

continuing said shot blasting until said outer surface of said cylinder has a hardness of 30 Rockwell C or greater and said outer surface has a plurality of cup shaped indentations providing a surface of 300 to 500 microinches RMS;

blasting said outer surface of said cylinder with glass beads to remove any embedded fragments of the steel shot, and

rotatably mounting said cylinder in a coater and directly adjacent the moving paper web.

4,217,770

DRAWING HOLLOW BLANKS IN MULTIPLE STEPS

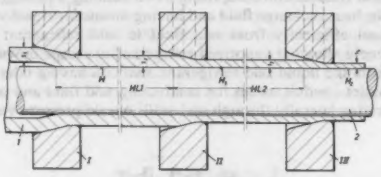
Johannes Wassen, Bielefeld, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,082

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738559

Int. Cl.² B21D 22/28

U.S. Cl. 72—349 **2 Claims**



1. Method of drawing hollow blanks comprising:

passing the hollow blank through a plurality of drawing dies for stretch-drawing the hollow blank in sequential reducing steps and onto a mandrel; and

spacing the drawing dies so that the resulting tensile stress in the hollow blank downstream from a die balances the adhesion to the mandrel ahead of the respective next reducing die as both said dies engage the hollow on the mandrel concurrently.

4,217,771

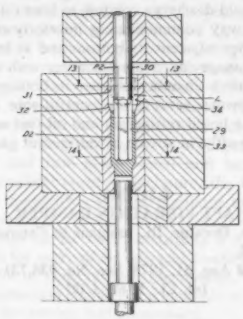
METHOD OF COLD FORMING

Frederick W. Braun, Bloomfield Hills, Mich., assignor to Braun Engineering Company, Detroit, Mich.

Division of Ser. No. 864,544, Dec. 27, 1977, Pat. No. 4,166,373. This application Feb. 2, 1979, Ser. No. 9,264

Int. Cl.² B21D 22/00

U.S. Cl. 72—358 **3 Claims**

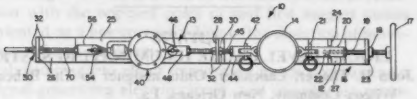


1. An extrusion machine for producing a part having a cylindrical outer surface and a polygonal inner surface comprising a die having an upper cavity shaped to accept an exteriorly lobed blank, having a lower cavity of smaller diameter than the lobe diameter of said blank, a conical die surface between said upper and lower cavities, a punch having a polygonal outer surface and means for moving said polygonal punch into contact with said lobed blank which is in said upper cavity and continuing its movement together with said blank into the lower cavity of said die thereby moving the metal from said lobes inwardly while causing reverse extrusion upwardly until all of the metal from said blank fills the cavities between said punch and die.

4,217,772
PROCESS FOR TESTING OF HYDRAULIC RELEASE DEVICES

Joseph Katz, Box 69, 529 Main St., Stoneham, Mass. 02180

Filed Feb. 27, 1979, Ser. No. 15,663
Int. Cl.[3] G01L *27/00*; G01M *19/00*
U.S. Cl. 73—4 R 5 Claims

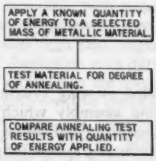


1. A process for preparing a hydraulic release latch for testing, said process comprising the steps of attaching said latch to a dynamometer, pulling upon said latch and said dynamometer until the latch has a predetermined magnitude of stress exerted thereon, locking the latch in said stressed condition, isolating the dynamometer from the stresses on said latch and transferring said latch, while still locked in said stressed condition, into a testing environment.

4,217,773
METHOD OF DETERMINING THE RELATIVE SOLID SOLUTION CONTAMINATE CONTENT OF METALLIC WIRES

Allen K. Long, Fulton County, and John M. Seibert, DeKalb County, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 26, 1979, Ser. No. 33,612
Int. Cl.[3] G01N *25/00, 33/20*
U.S. Cl. 73—15.6 7 Claims


APPLY A KNOWN QUANTITY OF ENERGY TO A SELECTED MASS OF METALLIC MATERIAL.
TEST MATERIAL FOR DEGREE OF ANNEALING.
COMPARE ANNEALING TEST RESULTS WITH QUANTITY OF ENERGY APPLIED.

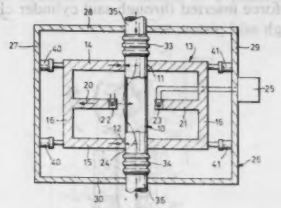
1. The method of determining relative solid solution contaminate content of a wire comprising the steps of:
(a) applying a selected quantity of thermal energy to the wire:
(b) testing the wire for the degree of annealing achieved by step (a) by elongating the wire to breakage; and
(c) comparing the results obtained in step (b) with the quantity of thermal energy applied in step (a).

4,217,774
APPARATUS FOR MEASURING THE VALUE OF A FLUID VARIABLE

Joram Agar, 2320 Blalock Rd., Houston, Tex. 77080

Filed Jan. 4, 1979, Ser. No. 1,041
Int. Cl.[3] G01N *9/00*
U.S. Cl. 73—32 A 26 Claims

1. Apparatus for measuring the value of a fluid variable comprising a vibratory tube through which the fluid may be passed; a holding structure rigidly fixing said vibratory tube at the nodes thereof for clamped-clamped flexural vibration, said holding structure having a stiffness at least 40% greater than that of the vibratory tube; driving means rigidly carried by said holding structure and arranged in operation to produce the said clamped-clamped flexural vibration of the vibratory tube; pick-up means rigidly carried by said holding structure and arranged in operation to respond to vibration of the vibratory tube; and a support which supports the holding structure and

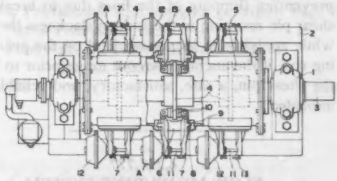


including isolator means which permit axial extension without compression of the vibratory tube.

4,217,775
LOAD TESTING APPARATUS

Kazuo Hikari, 29-2 2-chome, Minami kaneden, Suita-shi, Osaka, Japan

Filed Feb. 21, 1979, Ser. No. 12,967
Claims priority, application Japan, Jun. 2, 1978, 53-75900
Int. Cl.[2] G01L *3/20*
U.S. Cl. 73—135 3 Claims



1. A load testing apparatus, comprising:
(a) a rotary shaft supported by bearings, said rotary shaft being connectable with a machine to be tested;
(b) a rigid tubular member fitted onto the rotary shaft;
(c) at least one or more disks mounted on said rigid tubular member so as to be rotatable with said rotary shaft;
(d) ports on said rigid tubular member in positions located at least on one side of the circumferential direction of the disks;
(e) at least one or more disk brakes including bearing members, for braking said disk or disks, said disk brakes being mounted on said ports; and,
(f) a detector, coupled to said disk brakes, capable of detecting the load applied to the machine to be tested from a force applied to the bearing member of the disk brakes at the time of braking.

4,217,776
ANCHOR PULLOUT TESTING APPARATUS AND METHODS

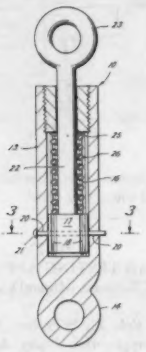
Richard H. McCall, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 905,262, May 12, 1978, abandoned. This application Oct. 2, 1978, Ser. No. 947,917
Int. Cl.[2] G01L *1/00*
U.S. Cl. 73—141 R 10 Claims

1. An apparatus for testing the minimum pullout strength of a ground anchor for an oil well derrick guy line positioned between a line to the anchor and a line to a power source comprising,
(a) an open ended cylinder with means on the closed end for connecting to the anchor line,
(b) a piston positioned in the closed end of the cylinder

having a piston connecting rod extending out of the cylinder open end with means for connecting to the power source,

(c) shear pin means that will break at a predetermined applied force inserted through said cylinder closed end and through said piston, and



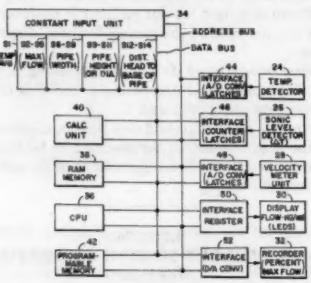
(d) spring means for the cylinder for damping extending movement of the piston when said shear pin breaks for preventing flopping of the lines due to breaking of said shear pin resulting in the sudden slackness therein so that while applying an increasing load on the piston connecting rod, if the anchor does not move prior to breaking of the shear pin, a safe, satisfactory, and reliable anchor is indicated.

4,217,777

FLOW MEASURING SYSTEM

Raymond A. Newman, Cheektowaga, N.Y., assignor to NP Industries, Inc., Tonawanda, N.Y.

Filed Jan. 12, 1979, Ser. No. 3,071
Int. Cl.[3] G01F *1/66*
U.S. Cl. 73—198 **6 Claims**



1. A system for measuring the flow of liquid through a channel which comprises

(a) sonic detector means having a head which is positionable at different distances from the base of the channel and provides data signals corresponding to the transit time for sonic signals between the top of the liquid and said head which are variable with the level of said liquid in said channel,

(b) means for providing data signals which vary with the velocity of said liquid flowing along said channel,

(c) means for generating constant data signals representing the cross sectional profile of said channel and the distance between said head and the base of said channel, and

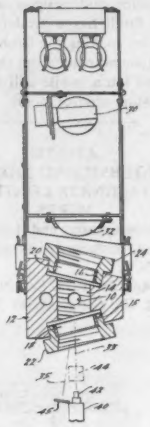
(d) means responsive to said variable data signals representing distance to the top of said liquid and velocity of said liquid and said constant data signals for obtaining an output corresponding to the flow of said liquid through said channel, in terms of the product of the area of said cross sectional profile of said channel through which said liquid is flowing and the velocity of said liquid.

4,217,778

LIQUID LEVEL GAUGE ILLUMINATING SYSTEM

John R. Thayer, Lancaster, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 23, 1978, Ser. No. 953,646
Int. Cl.[2] G01F *23/02*
U.S. Cl. 73—293 **2 Claims**



1. In an elongated viewing system for a Blackburn-type liquid level gauging assembly which includes a Blackburn gauge having aligned front and rear windows, a front display area, and a rear illuminating system for projecting light into the rear window, and having a light refracting prismatic fluid gauge passage therein visible through the windows and so proportioned that when liquid stands at a level in the passage between said windows, light from such source is directed outwardly through the front window in two beams, one of such beams being formed by light which has passed through the liquid and being laterally refracted to diverge from the other beam formed by light which has passed through the space above the liquid, and a camera positioned to observe only one of said beams, the improvement characterized by reflecting means positioned to intercept only the other of said beams and to reflect it back onto and illuminate the display area of the gauge.

4,217,779

LIQUID LEVEL SENSING MEANS

Noboru Masuda, Tokyo, and Mitsuyuki Suzuki, Okazaki, both of Japan, assignors to Denki Onkyo Co., Ltd., Tokyo and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Mar. 12, 1979, Ser. No. 19,573
Claims priority, application Japan, Mar. 13, 1978, 53/28466
Int. Cl.[3] G08B *5/36, 19/02*
U.S. Cl. 73—313 **6 Claims**

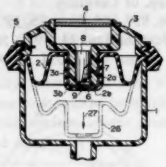
1. A liquid level sensing means in a liquid reservoir, said reservoir having a container base with an open top, a cap for closing said base, said cap having means permitting communication between said reservoir and the atmosphere, and a flexi-

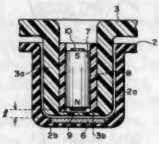
ble diaphragm sealingly disposed between said cap and said base separating liquid in said reservoir from the atmosphere, said diaphragm moving responsive to the level of said liquid, said sensing means comprising:

a. a cylindrically-shaped extension integrally depending from said cap into a cylindrically-shaped cup formed in said diaphragm proximate its center, said extension and said cup having complementary dimensions;

b. first magnet means disposed within said cylindrical extension with the opposed poles of said first magnet means oriented on a line corresponding to the direction of movement of said diaphram;

c. galvano-magneto effect transducing means constituting a signal-generating electric circuit, said transducing means comprising a magneto-resistive element attached to each opposed magnetic pole face of said first magnet means;





d. second magnet means carried by said diaphragm proximate its center and moveable with respect to said transducing means, said second magnet means being positioned in opposed relationship with said magneto-resistive element proximate said diaphragm even during movement of said diaphragm and influencing the magnetic flux density applied to said magneto-resistive element proximate said diaphragm for generating and electrical signal in said circuit when said second magnet means is lowered in accordance with change in the liquid level of fluid in said reservoir; and

e. said magneto-resistive element remote from said second magnet means being subjected to a substantial constant level of magnetic flux density.

4,217,780

AUTOMATED, SELF-CLEANING FLUID SAMPLING APPARATUS

J. Garland O'Connell, Waltham, and William C. Reynolds, Dedham, both of Mass., assignors to Ortho Diagnostic, Inc., Raritan, N.J.

Filed Jul. 9, 1979, Ser. No. 55,877
Int. Cl.[2] B01L *3/02*; G01N *1/10*
U.S. Cl. 73—421 R **5 Claims**

1. Automatic self-cleaning liquid sampling apparatus comprising:

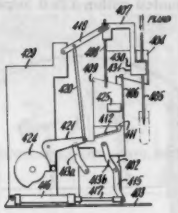
(a) a first stationary member including a fixed downwardly suspended sampling probe, energizing switch means proximate said probe, and a slide track generally parallel said probe;

(b) a second stationary member generally posterior said first stationary member, including a motor, cam means operated by said motor, and a piston-cylinder drive means;

(c) probe washer means, movable along said slide track, including a portion which envelops said probe and which slides along said probe as said probe washer means moves on said slide track;

(d) linkage means for moving said washer means along said slide track under motivation of said cam means;

(e) waste collection means, pivotable under motivation of said piston-cylinder drive means, to a position beneath said probe;



(f) means for supplying cleansing fluids to said probe and to said washer means for application to said probe; and

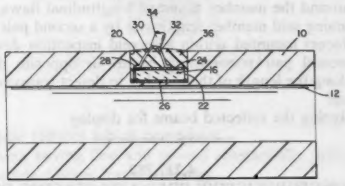
(g) control means, energized by said switch means, for selectively enabling said motor, said drive means, and said means for supplying in predetermined time sequences with respect to one another.

4,217,781

ULTRASONIC PARTICULATE SENSING

Leigh R. Abts, Providence, R.I., assignor to Micro Pure Systems, Inc., North Providence, R.I.

Filed Apr. 18, 1979, Ser. No. 31,066
Int. Cl.[3] G01N *29/02*
U.S. Cl. 73—632 **5 Claims**



1. A pulse echo device for obtaining information about matter discontinuities in a flowing fluid comprising:

a transducer for producing energy waves,

said transducer having a sidewall,

a sidewall surrounding and spaced apart from but in close proximity to said transducer sidewall whereby the spatial relationship between said surrounding sidewall and said transducer sidewall is such that over half the energy waves radiating from said transducer sidewall strike said surrounding sidewall at least twice and at angles of less than 90° thereby damping the waves before the waves can reflect back to strike said transducer sidewall.

4,217,782

ULTRASONIC INSPECTION DEVICE AND METHOD OF INSPECTION

Glen W. Pont, Lafayette, La., assignor to W. C. Lamb, Lafayette, La.

Filed Jul. 25, 1978, Ser. No. 927,946
Int. Cl.[3] G01N *29/04*
U.S. Cl. 73—637 **18 Claims**

1. A method of nondestructive ultrasonic testing of tubular members comprising the steps of:

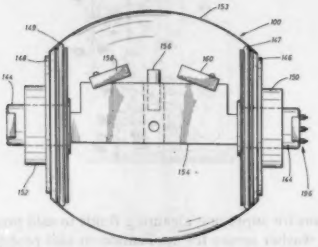
rotating the member to be inspected about its longitudinal axis;

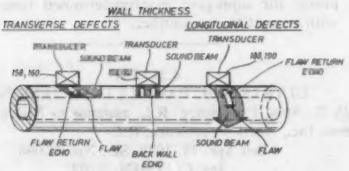
providing relative longitudinal movement between a pair of

ultrasonic inspection devices and said member; each inspection device including at least two ultrasonic transducers;

sonically coupling said devices to said member during the rotating and moving steps;

scanning said member circumferentially by a first pair of transducers mounted within a first inspection device, said





first pair transmitting sonic beams in opposite directions around the member to detect longitudinal flaws;

scanning said member lengthwise by a second pair of transducers mounted within a second inspection device, said second pair transmitting beams in opposite directions along the length of the member to detect transverse flaws; and

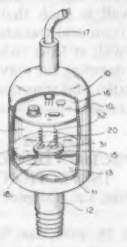
analyzing the reflected beams for display.

4,217,783

MAGNETORESISTIVE PRESSURE-SENSING DEVICE FOR AUTOMOTIVE ELECTRONIC ENGINE CONTROL SYSTEMS

Susumu Ito; Morimasa Nagao; Toshio Yamagata, and Nobuyuki Hayama, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Feb. 15, 1979, Ser. No. 12,376
Int. Cl.[2] G01L *9/04*
U.S. Cl. 73—720 **17 Claims**



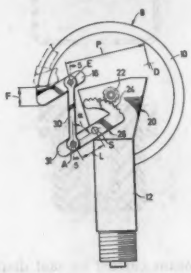
1. A magnetoresistive pressure-sensing device for use in an automotive electronic engine control system comprising: a casing having an interior space divided into two chambers by a partition plate having a central aperture; a diaphragm held fixed over said aperture and on said partition plate; means for introducing into one of said chambers a fluid having a pressure which is to be measured; means for introducing a fluid under a reference pressure into the other of said chambers; said diaphragm being deflectible under the pressure differential of said fluids introduced into the two casing chambers; at least one magnetoresistive element mounted on said diaphragm for producing an electric resistance change depending on the deflection of said diaphragm; and a detector for detecting the variation in electric resistance of said magnetoresistive element responsive to said deflection.

4,217,784

TUBE SPRING MANOMETER

Kurt Neubeck, Miltenberg, and Hermann Julien, Klingenberg, both of Fed. Rep. of Germany, assignors to Alexander Wiegand GmbH & Co. Armaturen- und Manometerfabrik, Klingenberg, Fed. Rep. of Germany

Division of Ser. No. 854,645, Nov. 25, 1977, Pat. No. 4,148,123.
This application Jan. 24, 1979, Ser. No. 5,969
Int. Cl.[2] G01L *7/04*
U.S. Cl. 73—732 **6 Claims**



1. A tube spring manometer comprising a deviation detector support, a tube spring rigidly connected at one end with the deviation detector support and at the other end with an end piece, a pointer train including a toothed segment to which a segment lever pivotally mounted on a segment axis belongs, and further comprising a tie rod which is rigid at least in the longitudinal direction, whose length is invariable and which articulates at the bearings both with an arm of the segment lever located on one side of the segment axis as well as with the end piece, circular holes being formed in said segment lever arm and in the end piece at the bearings, the segment lever arm being a massive, plate-like element in the region between a segment axis and one of the bearing holes and said end piece includes a plate-like element whose greatest dimensions lie in a plane common to said segment lever arm and wherein said tie rod is a plastic member which has two tabs which can be snapped into said bearing holes.

4,217,785

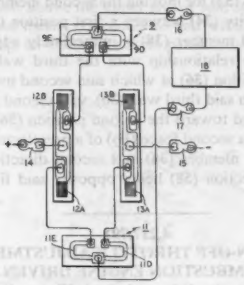
ERASABLE-FOIL-RESISTANCE COMPENSATION OF STRAIN GAGE TRANSDUCERS

Martin Spoor, Cambridge, Mass., assignor to Bofors America, Inc., Edison, N.J.

Filed Jan. 8, 1979, Ser. No. 1,698
Int. Cl.[3] G01B *7/20*
U.S. Cl. 73—766 **12 Claims**

8. A compensation unit for compensating a strain-gage transducer for zero-balance variations in output of its bridge network with temperature, comprising two flat foil strands of substantially equal resistance each physically exposed along one side of a flat insulating carrier for abrasion which will increase resistance thereof, said foil strands being integral with one another at a junction in a planar foil layer of material

having a predetermined relatively high temperature coefficient of resistance, each of said strands being integral with a separate relatively broad-area foil wiring tab at one end and with a third relatively broad-area wiring tab at said junction, and said



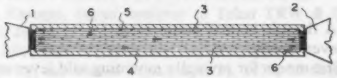
strands being integrally joined with said wiring tabs by constricted foil paths of narrow widths promoting surface-tension effects tending to hold molten solder from the wiring tabs against flow onto said strands.

4,217,786

TRANSMISSION CABLE FOR USE WITH AN ULTRASONIC DEVICE

Kenzo Okude, Kokubunji, and Koji Nirei, Tokyo, both of Japan, assignors to Nippon Electronics Limited, Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 945,995
Claims priority, application Japan, Jun. 13, 1978, 53-70415
Int. Cl.[3] B06B *3/00*
U.S. Cl. 74—1 SS **5 Claims**



1. A transmission cable for the transfer of ultrasonic vibration energy comprising a plurality of wires of equal length extending between an ultrasonic vibration energy source and a terminal working tool, and a flexible tubular member for housing said wires, said wires passing through said tubular member in spaced apart relationships with one another and said tubular member being filled with a liquid having a viscosity of 1 to 150 centipoises, whereby lateral deflections of said wires are suppressed.

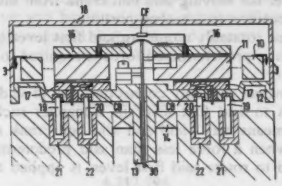
4,217,787

GYROSCOPIC APPARATUS

Alan P. Liebing, West Linton; James N. G. Scott, and Brian R. Shackleton, both of Edinburgh, all of Scotland, assignors to Ferranti Limited, Hollinwood, England

Filed Jun. 6, 1977, Ser. No. 803,641
Claims priority, application United Kingdom, Jun. 8, 1976, 23537/76
Int. Cl.[2] G01C *19/28*
U.S. Cl. 74—5.6 D **8 Claims**

1. Gyroscopic apparatus which includes a rotatable shaft, a gimbal attached to the shaft by a flexure suspension allowing limited rotation of the gimbal relative to the shaft about an axis perpendicular to the spin axis of the shaft, a rotor attached to the gimbal by a further flexure suspension allowing limited rotation of the rotor relative to the gimbal about an axis perpendicular to the spin axis of the shaft and to the axis of rotation of the gimbal, and pick-off means rotatable with and spaced from the gimbal and responsive to rotational movements of the gimbal about its axis of suspension to deliver



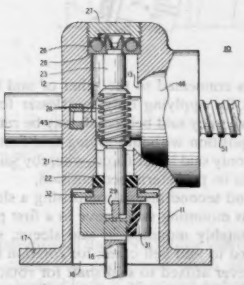
output signals representing the sense and magnitude of such movements.

4,217,788

GEAR REDUCER

John K. Burr, and William Wolf, both of Shrewsbury, N.J., assignors to Motion Systems Corporation, Shrewsbury, N.J.

Filed Jul. 12, 1978, Ser. No. 924,214
Int. Cl.[2] F16H *1/16*
U.S. Cl. 74—425 **6 Claims**



1. A gear reducer which comprises:
a housing having first and second substantially orthogonal cylindrical bores formed therein;
a shaft carrying a worm positioned in said first cylindrical bore;
a shaft carrying a worm gear positioned in said second cylindrical bore, said worm and worm gear engaging to provide said reduction;
means, associated with said first bore, for inhibiting simultaneously axial and radial displacement of said worm-carrying shaft; and
means, associated with said second bore, for inhibiting simultaneously axial and radial displacement of said worm gear carrying shaft.

4,217,789

HYDRAULIC DRIVE MEANS AND CONTROLS THEREFOR

Walter F. Larson, Plainview, Tex., assignor to Terrain King Corporation, Seguin, Tex.

Continuation of Ser. No. 796,395, May 12, 1977, abandoned, which is a continuation of Ser. No. 651,926, Jan. 23, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,785
Int. Cl.[2] G05G *11/00*
U.S. Cl. 74—470 **3 Claims**

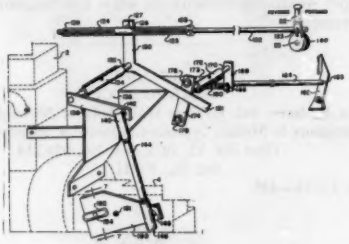
1. An apparatus for controlling the rotated position of a control shaft, which apparatus comprises;
a bell crank having first and second lever portions,
first means rotatably mounting said bell crank,
second means connecting said bell crank to said control shaft

in a manner such that said control shaft will be rotated to a neutral position when said bell crank is swung to a predetermined position,

a first lever for moving said bell crank from said predetermined position to a second position,

third means rotatably mounting said first lever in a manner such that a predetermined force is required to rotate said first lever,

a fourth means yieldably connecting one of said bell crank portions to said first lever in a manner such that said fourth means may yield and said bell crank may be rotated, when a force less than said predetermined force required to rotate said first lever, is applied to said bell crank,



fifth means connected to the other of said bell crank lever portions for applying only said lesser force to said bell crank, whereby said bell crank may be returned from said second position without moving said first lever, by overcoming only said lesser force, whereby said first lever will remain in its predetermined position,

said first and second means comprising a sleeve,

sixth means mounting said sleeve in a first position,

a shaft rotatably mounted in said sleeve, said shaft being connected to said bell crank for rotation thereby,

a second lever affixed to said shaft for rotation thereby,

a plate affixed to said control shaft for imparting rotation thereto, and

a link connecting said plate to said second lever for arcuately moving said plate to rotate said control shaft when said bell crank is rotating.

4,217,790

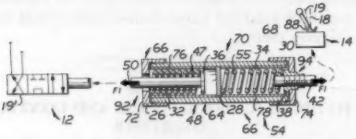
RESILIENT LINK APPARATUS

Victor E. Lindblom, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 30, 1978, Ser. No. 955,866

Int. Cl.[2] G05G *1/00*

U.S. Cl. 74—470 **9 Claims**



1. An apparatus (24), comprising:

a housing (25) having first, second and third walls (26,28,30) and first and second cavities (32,34), said first and second walls (26,28) defining the first cavity (32), said second and third walls (28,30) defining the second cavity (34);

first and second members (36,38) positioned in the first and second cavities (32,34), respectively;

first means (44) for moving the first member (36) in the first cavity (32) between a first position (46) at which said first member (36) is immediately adjacent and in contactable relationship with the second wall (28) and a second position (48) at which said first member (36) is spaced from said second wall (28), said first member (36) being moved toward the second position (48) in response to exerting a first force (F_1) of a preselected magnitude on said first member (36) in a first direction (50);

second means (52) for moving the second member (38) in the second cavity (34) between a first position (54) at which said second member (38) is immediately adjacent and in contactable relationship with the third wall (30) and a second position (56) at which said second member (38) is spaced from said third wall (30), said second member (38) being moved toward the second position (56) in response to exerting a second force (F_2) of a preselected magnitude on the first member (36) in a second direction (58), said second direction (58) being opposite said first direction (50).

4,217,791

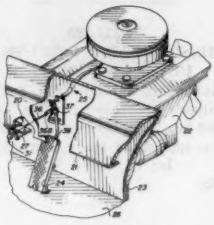
INSTANT ON-OFF THROTTLE ADJUSTMENT FOR INTERNAL COMBUSTION ENGINE DRIVEN VEHICLES

Fred Mineck, Phoenix, Ariz., assignor to Warren F. B. Lindsley, Phoenix and Lee D. Uto, Winkelman, both of, Ariz., part interest to each

Filed Sep. 13, 1978, Ser. No. 941,915

Int. Cl.[2] G05G *11/00*

U.S. Cl. 74—482 **9 Claims**



1. A throttle control comprising:

a lever means,

a first means for pivotally mounting said lever means on an internal combustion engine driven vehicle at the driver's position,

a second means attached to said lever means laterally thereof for use in pivotally moving said lever means,

said second means comprising a bolt threadedly attached to said lever means,

said bolt upon movement relative to said lever arm forming a vernier adjustment for throttle control of the engine of the vehicle,

flexible means for attachment at one end thereof to the acceleration mechanism of the vehicle and at the other end to one end of said second means,

catch means mounted on said lever means and detachably connectable with the vehicle whereby when said lever means it pivoted in one direction to move the acceleration mechanism against its biasing means it varies the throttle setting of an engine of the vehicle, and

third means for releasing said lever means from the vehicle, said lever means pivoting back to its initial position under the biasing effect of the acceleration mechanism of the vehicle acting through said flexible means.

4,217,792

STEERING COLUMN FOR VEHICLES

Keith Kesling, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

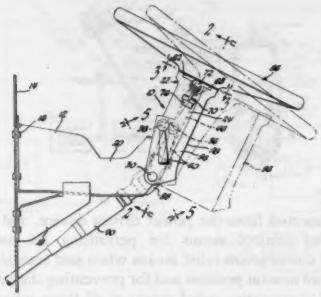
Filed Aug. 24, 1978, Ser. No. 936,373

Int. Cl.[2] B62D *1/18*

U.S. Cl. 74—484 R **3 Claims**

1. A steering column assembly for a vehicle comprising a support secured within said vehicle, an elongated steering

column housing having a lower end operatively connected to said support and extending generally upwardly therefrom to a terminal and upper end, rotatable steering shaft means extending through said column housing and terminating above the upper end thereof, handwheel means operatively connected to the steering shaft above the upper end of said steering column housing, control means connected to and within said steering column housing, an enlarged access panel removably secured



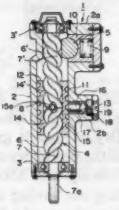
to said steering column housing and forming the under side of steering column to provide access to said control means to facilitate the inspection and removal and reinstallation of said control means with respect to the interior of said steering column housing, and end cap means removably connected to upper portion of said steering column housing and said access panel to secure said access panel to said steering column housing and to close the upper end of said steering column.

4,217,793

RACK AND PINION TYPE STEERING GEAR

Michio Abe, Kasugai, Japan, assignor to Tokai TRW & Co., Ltd., Aichi, Japan

Filed Jun. 21, 1978, Ser. No. 917,510
Claims priority, application Japan, Apr. 24, 1978, 53-48427
Int. Cl.[2] B62D *1/20*; F16H *1/16*
U.S. Cl. 74—499 **7 Claims**



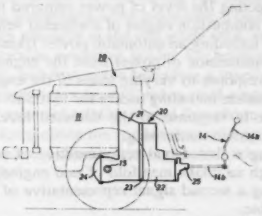
1. A rack and pinion type steering gear for an automobile comprising a housing; a pinion rotatably supported in said housing to receive turning effect from a steering wheel of said automobile; and a rack meshed with said pinion and slidably supported in said housing, said rack being adapted to be connected to a tie rod which is in turn connected to wheels of said automobile, said steering gear characterized in that said pinion comprises first and second pinion portions rotatable separately from each other and having spiral gear teeth reversely provided to each other, respectively, said first pinion portion being adapted to be connected to said steering wheel and said second pinion portion being meshed with said rack, and further comprising variable steering ratio means including a variable steering ratio sleeve rotatably and axially slidably supported in said housing, having a spiral internal gear meshed with said first pinion portion and being connected to said second pinion portion so as to transmit said turning effect to said second pinion portion; and variable sleeve spiral motion means provided between the engaging surfaces of said housing and said variable sleeve and having a guide groove of variable lead angle and a pin engaged with said guide groove.

4,217,794

LUBRICATING DEVICE FOR FINAL DRIVE GEARING OF POWER TRANSMISSION UNIT

Yasuyoshi Yasui; Makoto Uno, both of Toyota, and Yoshio Sanui, Okazaki, all of Japan, assignors to Toyoda Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 26, 1978, Ser. No. 928,178
Claims priority, application Japan, Nov. 15, 1977, 52/153133[U]
Int. Cl.[2] F16H *37/08*
U.S. Cl. 74—700 **5 Claims**



1. In a power transmission unit for a motor vehicle comprising: a trans-axle casing for connection at its upright front seating face to a cylinder block of an engine and at its upright rear seating face to a transmission casing for change-speed gearing means, said trans-axle casing having an upper compartment for containing a disengageable coupling for connection to a crankshaft of said engine and a lower compartment, the lower compartment being provided with an upright partition wall to subdivide the compartment into front and rear chambers; and a final drive gearing means and a differential gear means located within the lower compartment, said final drive gearing means including a drive pinion shaft supported by a pair of axially spaced tapered roller bearings carried on said partition wall and a drive pinion integral with said drive pinion shaft and located within the front chamber, said drive pinion shaft being coaxially connected to said change-speed gearing means in the rear chamber, and said differential gear means being arranged in front of said drive pinion and including a crown wheel driven by said pinion;

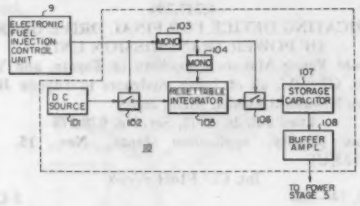
the improvement wherein said partition wall is formed therein with an axial cavity at one side of said drive pinion shaft and opening toward the front chamber to receive lubricating oil picked up by said crown wheel and a lateral hole communicating said cavity into an annular space around said drive pinion shaft between said bearings to permit the lubricating oil to pass through both said bearings toward the front and rear chambers, said partition wall being formed with a projecting rim which extends around the upper and side edges of said cavity opening, and an inclined guide surface which extends downwardly from the lower edge of said cavity opening and is broader below the outer periphery of said crown wheel, and said partition wall being further provided at the bottom portion thereof with an aperture interconnecting the front and rear chambers.

4,217,795

ENGINE LOAD DETECTION SYSTEM FOR AUTOMATIC POWER TRANSMISSION

Fukashi Sugasawa; Nagayuki Marumo, both of Yokohama; Haruhiko Iizuka, and Junichiro Matsumoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 22, 1977, Ser. No. 863,140
Claims priority, application Japan, Jan. 6, 1977, 52/530
Int. Cl.[2] B60K *41/04*
U.S. Cl. 74—858 **2 Claims**



1. A system for detecting the level of power required for a multicylinder internal combustion engine of a wheeled vehicle to deliver, the vehicle including an automatic power transmission mechanism for transmission of power from the engine to the vehicle wheels in response to varying loads of the engine, the transmission mechanism including means for hydraulically varying fluid pressure in response to the detected level of power, said detecting system comprising:

means for generating a first signal representative of mass flow of air through an intake manifold of said engine;

means for generating a second signal representative of the speed of said engine;

means for arithmetically dividing the magnitude of said first signal by the magnitude of the second signal to provide an output signal representative of the quantity of air passing through said intake manifold per unit time; and

an electromechanical valve assembly responsive to said output signal to control said hydraulic fluid pressure varying means;

said engine including an electronic fuel injection system, and means connected to the fuel injection system for converting the width of an injection pulse applied thereto into a voltage signal of which the magnitude represents the width of the applied pulse, and

said injection pulse width converting means comprising:

a resettable integrator;

a first electronic switch responsive to the presence of said injection pulse to apply a DC voltage to said integrator to allow its output to increase with time;

a first monostable multivibrator responsive to the trailing edge of said injection pulse to provide a first output pulse;

a storage capacitor;

a second electronic switch responsive to said first output pulse to supply said capacitor with the output of said integrator;

a second monostable multivibrator responsive to the trailing edge of said first output pulse to reset said integrator; and

a buffer amplifier connected to said storage capacitor.

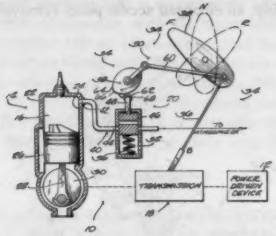
4,217,796

COMPRESSION REDUCING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

James A. Donohue, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 13, 1978, Ser. No. 942,024
Int. Cl.[3] B60K *41/04*; F01L *13/08*
U.S. Cl. 74—860 **24 Claims**

1. An apparatus for delivering power to a power driven device, which apparatus comprises an engine having a combustion chamber and including compression relief means for selectively venting said combustion chamber with the atmosphere, transmission means for operatively connecting said engine with the power driven device, said transmission means having a drive position in which said engine powers the power driven device and a neutral position in which said engine is operatively disconnected from the power driven device, and compression relief control means for permitting the venting through said compression relief means when said transmission means is in said neutral position and for preventing the venting through said compression relief means at all times when said transmission means is in said drive position.

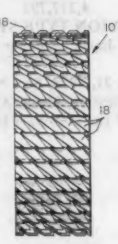


4,217,797

METHOD FOR PRODUCING A SPARK WHEEL

Edward M. Tuckerman, Cohasset, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jun. 6, 1978, Ser. No. 913,179
Int. Cl.[2] B23D *73/08*
U.S. Cl. 76—101 A **4 Claims**



1. In a method of producing a spark wheel including the steps of forming a plurality of spaced grooves and lands extending diagonally around the periphery of a cylindrical wheel blank and subsequently forcing said blank coaxially through the bore of a first broaching die having a plurality of circumferentially spaced cutting surfaces which cut spaced notches across said lands to form a plurality of axially and circumferentially spaced teeth on said blank, the improvement comprising:

subjecting said blank to an additional broaching step to remove portions of said teeth formed by said first broaching die.

4,217,798

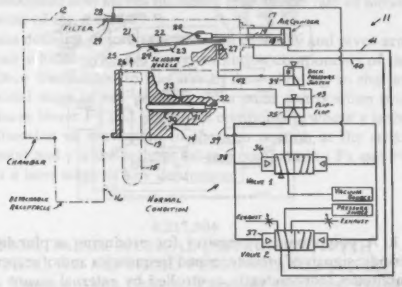
AUTOMATED TEST TUBE STOPPER REMOVER

Charles J. McCarthy, Rockville, and Maurice Green, Silver Spring, both of Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Apr. 30, 1979, Ser. No. 34,560
Int. Cl.[3] B67B *7/08*
U.S. Cl. 81—3.2 **14 Claims**

1. A test tube stopper-removing device comprising a cham-

ber, duct means provided on said chamber and defining a passage for inserting a stoppered test tube into the chamber from below so that the test tube can be moved vertically to elevate its stopper into the chamber, positive fluid pressure source means, a vacuum source, a fluid pressure cylinder secured to the chamber and having piston rod means movable in the chamber, a stopper-removing plunger member pivotally connected to said piston rod means, said plunger member being located so as to be engageable by the stopper of a test tube as



the test tube is elevated in said passage, means to operatively connect said positive fluid pressure source means to said cylinder to extend said piston rod means and to drive said plunger member laterally against a stopper responsive to engagement of the upwardly moving stopper with the plunger member, so as to remove the stopper from its test tube, and means to communicatively connect said chamber to said vacuum source simultaneously with the removal of the stopper, whereby to induce a rush of air upwardly through said passage and prevent the escape of aerosols from the unstoppered test tube.

4,217,799

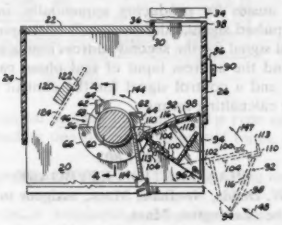
CANDLE LATHE

W. Frank Faris, 4026 S. Villa, Oklahoma City, Okla. 73119

Filed Feb. 26, 1979, Ser. No. 15,373

Int. Cl.[2] B23B *3/00, 3/02, 3/28*

U.S. Cl. 82—1 C **7 Claims**



7. The method of forming duplicate candle configurations, comprising:

placing a first cylindrical candle between the spindlehead and tailstock of a lathe;

turning said first candle to form a desired exterior configuration on said first candle;

placing a panel adjacent and parallel with the axis of said first candle;

placing a light source adjacent said first candle diametrically opposite said panel;

energizing said light source for casting a shadow image on said panel;

tracing the outline of said first candle shadow image on said panel;

replacing said first candle with a second cylindrical candle; and,

turning said second candle while maintaining said light source energized until the shadow image of said second candle coincides with the traced shadow image of said first candle.

4,217,800

STOCK-FEEDING APPARATUS

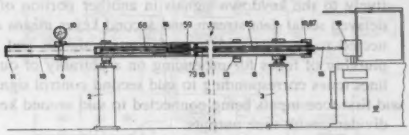
Marcel Furegati, Zurich, Switzerland, assignor to Hydaira-Coreal AG, Switzerland

Filed Jan. 4, 1979, Ser. No. 808

Claims priority, application Switzerland, Jan. 10, 1978, 220/78; Nov. 22, 1978, 11976/78

Int. Cl.[3] B23B *13/00;* **B23Q** *5/22*

U.S. Cl. 82—2.5 **12 Claims**



1. A device for conveying rod stock to a processing machine, comprising a rod guide tube, a fluid-activated first piston axially movable in the rod guide tube, said first piston having a rotatable centering holder for holding one end of the rod stock, said first piston including a member forming a cylinder for receiving a second piston, said second piston being movably mounted relative to said first piston and including a piston rod for pushing the rod stock to said processing machine, said piston rod extending through said holder for engaging said rod stock.

4,217,801

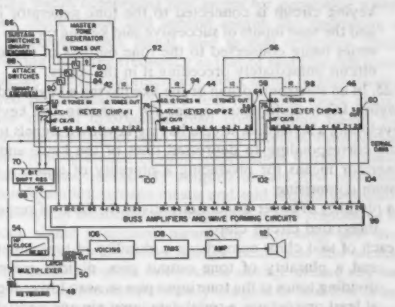
SOLO SUSTAIN KEYER SYSTEM

Brian N. Wilcox, Kettering, Ohio, and John W. Robinson, Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Nov. 20, 1978, Ser. No. 962,003

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.01 **23 Claims**



1. In an electronic organ or the like having a keyboard with playing keys, multiplexer means for scanning the keys and developing a serial data stream having keydown signals in time slots corresponding to depressed ones of the keys and tone generator means for producing a plurality of tones, a keyer system comprising:

a first keyer-divider circuit comprising a plurality of first tone inputs, first demultiplexer means having a serial data input connected to receive the serial data stream for demultiplexing the serial data stream and producing control signals corresponding respectively to the keydown pulses in one portion of said data stream, first keyer means responsive to said control signals and connected to receive

tones on said tone inputs for producing on a plurality of output lines tones corresponding to said control signals, and serial data output means for delaying said data stream by at least one octave, and

a second keyer-divider circuit comprising a plurality of second tone inputs connected to receive said plurality of tones, a plurality of tone outputs, divider means connected between said second tone inputs and said tone outputs for producing at the outputs tones corresponding to the tones on the second inputs lowered by at least one octave, second demultiplexer means having a serial data input connected to said first keying circuit serial data output means for demultiplexing the delayed serial data stream and producing second control signals corresponding respectively to the keydown signals in another portion of the delayed serial data stream, and second keyer means connected to receive said second control signals and said plurality of tones for producing on a plurality of output lines tones corresponding to said second control signals,

said first tone inputs being connected to said second keyer-divider circuit tone outputs.

9. In an electronic organ or the like having a keyboard with playing keys, multiplexer means for scanning the keys and developing a serial data stream having keydown signals in time slots corresponding to depressed ones of the keys, and tone generator means for producing a plurality of tones, a keyer system comprising:

a plurality of keyer-divider circuits each corresponding to the keys of at least one octave,

each of said keyer-divider circuits comprising: a plurality of tone inputs and a plurality of tones outputs, divider means for dividing tones at the tone inputs so as to lower them by at least one octave, a serial data input connected to receive said serial data stream and a serial data output, demultiplexer means for demultiplexing said serial data stream to produce a plurality of control signals corresponding to keydown signals in the data stream, and keyer means controlled by said control signals and receiving the tones on said tone inputs for producing on a plurality of output lines tones corresponding to said control signals,

said keyer-divider circuits tone inputs and outputs being connected in series wherein the tone input of the first keying circuit is connected to the tone generator means and the tone inputs of successive said keying cirucits in the series being connected to the tone outputs of the keying circuit immediately preceding it in the series.

23. In an electronic organ or the like having a keyboard with playing keys, multiplexer means for scanning the keys and developing a serial data stream having keydown signals in time slots corresponding to depressed ones of the keys, and tone generator means for producing a plurality of tones, a keyer system comprising:

a plurality of keyer-divider circuits in the form of respective integrated circuit chips,

each of said chips comprising a plurality of tone input pins and a plurality of tone output pins, divider means for dividing tones at the tone input pins so as to lower them by at least one octave, a serial data input pin and a serial data output pin, demultiplexer means for demultiplexing said serial data stream to produce a plurality of control signals corresponding to keydown signals in the serial data stream, and keyer means controlled by said control signals and receiving tones on said tone input pins for receiving on a plurality of tone output pins tones corresponding to said control signals,

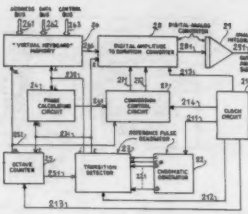
said chip tone input and output pins being connected in series with the tone input pins of the first chip being connected to said tone generator means and the tone input pins of successive chips in the series being connected to the tone output pins of the chip immediately preceding it in the series.

4,217,802

POLYPHONIC DIGITAL SYNTHESIZER

Christian J. Deforeit, 202, rue des Joncs Marins, 91621 La Ville de Bois, France

Filed Jun. 23, 1978, Ser. No. 918,576
Claims priority, application France, Jul. 1, 1977, 77 20245
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.01 14 Claims



1. A polyphonic synthesizer for producing a plurality of periodic signals of predetermined frequencies and of respective amplitudes independently controlled by external means comprising:

a set of digital memories at least equal in number to the periodic signals to be simultaneously produced by the synthesizer, said set of memories including first address, data and control inputs for storing amplitude digital data in the memories from said external means and second address inputs and a data output;

phase calculating circuit means having an address input, a control input for controlling the incrementation of a phase digital value and an output for delivering said incremented phase digital value;

digital-analog converting means having a digital input connected to the data output of the set of memories, an analog output and control inputs;

transcoding means connected between the output of the phase calculating circuit and the control inputs of the digital-analog converting means;

means for producing a set of pulsing signals of different frequencies distributed in a musical range; and

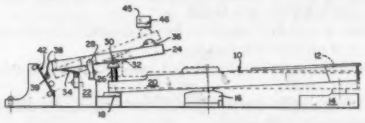
control means for producing sequentially, in response to each pulsed signal, address signals corresponding to said pulsed signal for the second address inputs of said memories and the address input of said phase calculating circuits, and a control signal for the control input of said phase calcualting means.

4,217,803

PIANO-ACTION KEYBOARD

Philip V. W. Dodds, Needham, Mass., assignor to ARP Instruments, Inc., Lexington, Mass.

Filed Jan. 2, 1979, Ser. No. 588
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.1 12 Claims



1. A piano-action keyboard for an electronic musical instrument comprising

a plurality of elongated keys,

a supporting base,

each of said keys being pivotally mounted on said supporting base,

a plurality of arms pivotally mounted on said base, each arm being adjacent one end of a key and arranged so that when the key is pivoted, a driving force is imparted to the adjacent arm by direct striking of the arm by the key at a strike point,

electrical signal means comprising a mechanical component mounted on each said pivoted arm and plural portions of said signal means each of which is responsive to movement of one said arm to generate an electrical signal as the associated arm moves including response to rate of movement of the arm

means defining an interface between each key and pivot-arm pair which varies the force resolution components of the force transmitted to the arm by key pivoting so that an initial stage of key pivoting from an at rest position produces lower Fy and higher Fx components where y is the direction of movement of the arm portion at the strike point and y is the orthogonal to x compared to Fx and Fy at a later stage of key depression.

4,217,804

ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC ARPEGGIO PERFORMANCE DEVICE

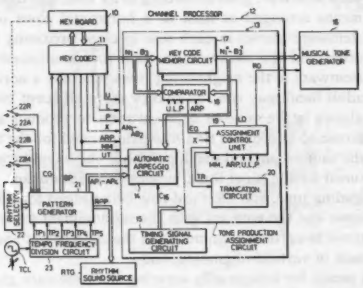
Eiichi Yamaga; Akira Nakada; Takatoshi Okumura; Eiichiro Aoki; Akiyoshi Oya, and Yasuji Uchiyama, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 17, 1978, Ser. No. 952,098

Claims priority, application Japan, Oct. 18, 1977, 52-124947; Nov. 4, 1977, 52-132368

Int. Cl.³ G10H *1/38, 1/42*

U.S. Cl. 84—1.03 **11 Claims**



1. An electronical musical instrument of a type capable of selectively sounding one or more designated tones, comprising:

sounding tone designating means for designating tones to be sounded;

constituent order nominating means, connected to said sounding tone designating means, for specifying the pitch order values of the respective designated tones when repeated through octaves;

an order pattern generator for generating numerical signals timewisely aligned one after another in a predetermined pattern, said numerical signals respectively defining the ordinal pitch locations of the constituents of an arpeggio to be played, said numerical signals being generated independently of the pitch order values of the designated tones;

tone selection means, connected to said constituent order nominating means and to said order pattern generator, for selecting tones which, with respect to said specified pitch order values, are in the ordinal locations identified by said numerical signals; and

musical tone producing means, connected to said tone selection means, for producing musical tones corresponding to the selected tones.

4,217,805

APPARATUS AND METHOD FOR WRITING RHYTHM INFORMATION IN STORAGE

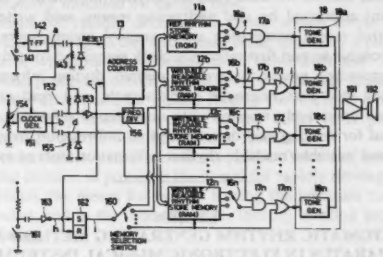
Yukio Tamada, Amagasaki, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Dec. 27, 1978, Ser. No. 973,571

Claims priority, application Japan, Oct. 3, 1978, 53-122225

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **6 Claims**



1. An apparatus for writing information concerning a rhythm pattern unit in a storage for generation of a rhythm by way of a repetition of said rhythm pattern unit by an electronic musical instrument, comprising: first reference rhythm information storage means having a storing region including a plurality of addresses for storing in advance, in an address sequence, reference rhythm information concerning a given kind of rhythm pattern unit comprising a combination of first and second information elements, said first information element and said second information element representing respective notes in binary format, second writable/readable rhythm information storage means including a storing region having addresses corresponding to the addresses of said first reference rhythm information storage means for writing/reading, in an address sequence, desired rhythm information concerning a desired rhythm pattern unit comprising a combination of said first and second information elements, reference clock signal generating means comprising first means for generating a first reference clock signal and second means for generating a second reference clock signal, said second reference clock signal having the same frequency as that of said first reference clock signal, said second reference clock signal further having a delayed phase relative to said first reference clock signal, reference rhythm information read commanding means for commanding reading of said reference rhythm information from said first reference rhythm information storage means, addressing means operatively coupled to said first reference rhythm information storage means and said second writable/-readable rhythm information storage means and responsive to said clock signal generating means for addressing said first reference rhythm information storage means and said second writable/readable rhythm information storage means, rhythm signal generating means operatively coupled to said first reference rhythm information storage means and said second writable/readable rhythm information storage means for generating a rhythm signal representing said rhythm pattern unit stored in said first and second storage means, write commanding means for commanding writing of a desired rhythm information concerning a desired rhythm pattern unit comprising a combination of said first and second information elements, means responsive to said reference rhythm information read commanding means for generating an indication of said reference rhythm information, said write commanding means being operated by an operator with reference to said indication of said reference rhythm information, whereby said desired rhythm information is stored in said second writable/readable rhythm information storage means in a desired corresponding relation with said reference rhythm information in terms of the

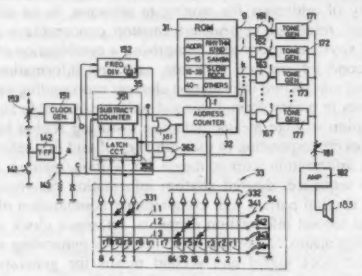
addresses of said first reference rhythm information storage means and said second writable/readable rhythm information storage means, and write/read control means responsive to said write commanding means for writing said desired rhythm information concerning a desired rhythm pattern unit by way of a combination of said first and second information elements in the addresses of said second writable/readable rhythm information storage means addressed by said addressing means and for reading said desired rhythm information from the addresses of said second writable/readable rhythm information storage means addressed by said addressing means, said write/read control means comprising write control means operatively responsive to said first reference clock signal and to said write commanding means for writing desired rhythm information during said first reference clock signals, and read control means operatively responsive to said second reference clock signal for reading said desired rhythm information from said second writable/readable rhythm information storage means.

4,217,806

AUTOMATIC RHYTHM GENERATING METHOD AND APPARATUS IN ELECTRONIC MUSICAL INSTRUMENT

Tadao Sakai, Hamamatsu, and Yukio Tamada, Amagasaki, both of Japan, assignors to Roland Corporation, Osaka, Japan

Filed Dec. 27, 1978, Ser. No. 973,605
Claims priority, application Japan, Sep. 28, 1978, 53/120102
Int. Cl.[3] G10H *1/40*
U.S. Cl. 84—1.03 **14 Claims**



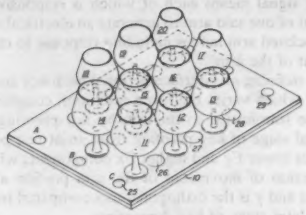
1. An apparatus for automatically generating a rhythm signal in an electronic musical instrument based on rhythm information, comprising: storage means including a storing region having a plurality of addresses for storing, in an address sequence, rhythm information concerning a given kind of rhythm pattern comprising a combination of first and second information units representing notes in binary form, reference clock signal generating means for generating reference clock signals, read commanding means for commanding reading of said rhythm information from said storage means, addressing means operatively coupled to said storage means and responsive to said read commanding means and said clock signal generating means for addressing said addresses of said storage means for reading said rhythm information stored in said storage means, presetting means for presetting the number of said clock signals associated with said kind of rhythm pattern and required for skipping the addresses of said storage means for reading said rhythm information, address controlling means responsive to said read commanding means and said clock signals for controlling said addressing means for skipping in succession said addresses being addressed each time said preset number of said clock signals are supplied, and means responsive to said rhythm information read from said storage means for generating a rhythm signal representing said rhythm pattern stored in said storage means.

4,217,807

STEMWARE MUSICAL INSTRUMENT

Donald Nutting, 1295 Ithaca Dr., Boulder, Colo. 80303, and James P. Turner, 905 Grape St., Boulder, Colo. 80302

Filed Jul. 21, 1978, Ser. No. 926,722
Int. Cl.[2] G10D *13/08*
U.S. Cl. 84—402 **8 Claims**



1. A musical instrument including a plurality of stemware glasses, each tuned to a particular musical note which may include being partially filled with water, and producing such notes on being struck or rim rubbed, comprising:

(a) base means arranged to support at least eight such stemware glasses on the upper surface thereof in upright position;

(b) tone indicia means marked on each stemware glass indicating the particular musical tone including those partially filled with water;

(c) base indicia means on said base indicating the position of each stemware glass according to its tone, said base indicia means arranged at least in 3 horizontal rows with the stemware glasses in each row in close proximity to each other and the stemware in each row is adjacent to the stemware in the neighboring rows whereby a normal size adult hand may rim rub two or more adjacent stemware glasses in the same or adjacent rows to produce a predetermined chord, the first row being tuned for the tones of the submediant and the upper tonic; the second row being tuned for the super tonic, subdominant, dominant, and the leading tone, and the third row being tuned for the lower tonic and the mediant with the subdominant and mediant tones in vertical alignment and the submediant and dominant in vertical alignment; and

(d) means for temporarily securing the stemware glasses to said base means.

4,217,808

DETERMINATION OF PITCH

David Slepian, 212 Summit Ave., Summit, N.J. 07901, and Edward J. Weldon, Jr., 1152 Kealaolu Ave., Honolulu, Hi. 96816

Continuation-in-part of Ser. No. 816,740, Jul. 18, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,401
Int. Cl.[3] G10G *7/02*; G01R *23/02*
U.S. Cl. 84—454 **17 Claims**

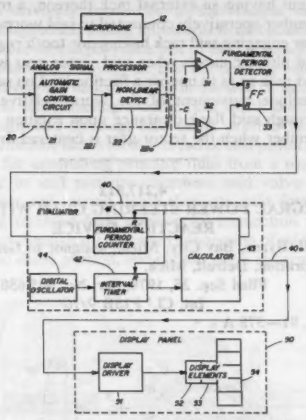
1. The method of determining the pitch of a periodic musical tone which comprises the steps of:

(1) converting the periodic wave of the tone into an electrical signal;

(2) detecting each first excursion of said signal above a prescribed positive threshold after a lower level negative crossing;

(3) determining a measure of the pitch period of the signal by measuring the time interval between a prescribed number

of such excursions indenpendently of the axis crossings of the signal between successive detections; and



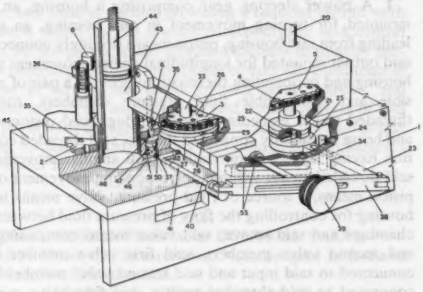
(4) using the period thus determined to provide an indication of the pitch of said periodic wave.

4,217,809

BULLET SIZING AND LUBRICATING SYSTEM

Bruce Hertzler, Rte. 5, Box 5400, Albuquerque, N. Mex. 87123

Filed Jan. 9, 1978, Ser. No. 867,818
Int. Cl.[2] F42B *31/02*
U.S. Cl. 86—19 **3 Claims**



1. A system for simultaneously sizing and lubricating lead bullets comprising:

a bolted frame, which supports an electric constant speed motor, which drives a V-belt which drives a worm gear on a drive shaft, and said bolted frame supporting a die base having therein a die; and,

a bevel gear fixedly attached to the drive shaft,

a mating bevel gear fixedly attached to vertical drive shaft, which has at its approximate mid-point a power sprocket,

an indexing plate generally shaped like a spool having two flanges, the upper flange being an indexing sprocket driven by a chain which in turn is driven by the power sprocket, and the lower flange of the indexing plate being a circular locking surface, except for an indexing cut out,

and the indexing plate having an indexing bar between the two flanges in the vicinity of the indexing cut out,

and the indexing plate being rotatably mounted to the die base,

and a transfer plate having the shape of generally a cylindrical plate whose cylindrical surface is machined so that the upper portion of the cylindrical surface has a plurality of finger and notches which mate with the indexing bar, and the lower portion of the cylindrical surface, having scallops whose radii of curvature is the same as the radius of curvature of the locking surface of the indexing plate and the transfer plate having a plurality of bullet receiving holes, in its upper plate surface disposed so that when the transfer plate is locked into a stationary position one bullet receiving hole is deposed between a punch and said die, and upon being indexed by the indexing plate the next bullet receiving hole is moved to and locked in a position between the punch and die, and the transfer plate being rotatably mounted on the die base;

a means for rapidly driving the punch which forces the bullets through a die, said means being driven by a punch drive wheel fixedly attached to the drive shaft and

a means positively driven by said bevel gear fixedly attached to the drive shaft, for rapidly forcing the lubricant from a lubricant pressurized supply to the bullet as it passes through the die without waste of lubricant,

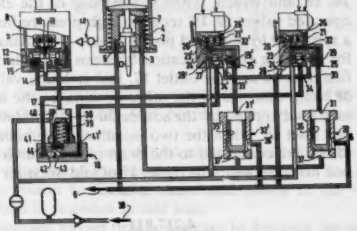
wherein the drive shaft provides a common source of motion and division of power to the means for rapidly driving the punch, the means for rapidly forcing the lubricant to the bullet, and to the indexing plate, thereby insuring proper timing.

4,217,810

REGULATION SYSTEM FOR STEAM TURBINES

Pierre Vaudrey, Belfort, France, assignor to Alsthom-Atlantique, Paris, France

Filed Oct. 4, 1978, Ser. No. 948,613
Claims priority, application France, Oct. 6, 1977, 77 30111
Int. Cl.[3] F15B *9/03, 9/09, 13/044*
U.S. Cl. 91—363 A **1 Claim**



1. A regulation system for a steam turbine, said system including:

a servomotor **1** comprising firstly, a piston **2** slidable within a chamber **3**, one end of said chamber being connected to a drain pipe **6** and the other end being connected to a fluid inlet **7** which controls the piston **2**, and secondly a spring **4** tending to move the piston **2** away from the chamber end connected to the drain pipe **6** ;

a regulation circuit **13** for comparing a steam admission signal and a signal from the servomotor **1** which is a function of the position of the piston **2** and which delivers an error signal;

a servo valve **8** comprising: firstly a control inlet **16** connected to a pipe connected to a high-pressure fluid source **30**, a control outlet **15** connected to the control fluid inlet **7** of the servomotor **1** and an outlet **14** connected to the drain pipe **6**, and secondly a torque motor **9** and a slide valve **12** whose position is controlled by said torque motor **9** which receives the servomotor error signal, said slide valve **12** coupling the control outlet **15** with the drain pipe **6** when the error signal corresponds to excessive steam admission, or coupling the control outlet **15** with the control inlet **16** when it corresponds to insufficient steam admission;

two electrically operated valves **19**, **19'**, each including

means for receiving a signal which operates them in the case of accident, each electrically operated valve having an inlet **28**, **28'** connected to the high-pressure fluid source **30**, a first outlet **33**, **33'** connected to the drain pipe **6** and a second outlet **29**, **29'** connected to a safety valve **32**, **32'**, the second outlet **29**, **29'** communicating with the inlet **28**, **28'** when the electrically operated valve **19**, **19'** is operated and with the first outlet **33**, **33'** when the electro-valve **19**, **19'** is released;

each safety valve **32**, **32'** comprising: firstly, an outlet **36**, **36'** connected to the drain pipe **6**, an inlet **31**, **31'** connected to the second outlet **29**, **29'** of the associated electrically operated valve **19**, **19'** and a second inlet **37**, **37'** connected to the control fluid inlet **7** of the servomotor **1**, and secondly, a moving piston **35**, **35'** movable to two positions: a first position when high-pressure fluid is applied to the inlet **31**, **31'** and a second position when the inlet **31**, **31'** is connected to the drain-pipe **6**, the second inlet **37**, **37'** being connected to the drain-pipe **6** when the piston **35**, **35'** is in the second position and being isolated from the drain-pipe **6** when the piston **35**, **35'** is in the first position, the improvement wherein:

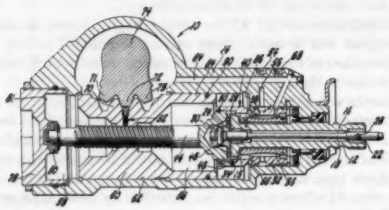
each electrically operated valve **19**, **19'** has a third outlet **34**, **34'** and means **18** for connecting said third outlet **34**, **34'** to the drain-pipe **6** when the electrically operated valve **19**, **19'** is operated and for connecting said third outlet **34**, **34'** to the high-pressure fluid source **30** when the electrically operated valve **19**, **19'** is released and wherein the pipe connected to the inlet **16** of the servovalve **8** is connected to the high-pressure fluid source **30** via an isolation valve **18** which comprises a spring biased piston **38**: and firstly, a first inlet **40** connected to the high-pressure fluid source **30** and an outlet **17** connected to said pipe as well as two control inlets **41**, **41'** which are connected to the third outlets **34**, **34'** of both of the electrically operated valves **19**, **19'** and which, when at least one of the electrically operated valves **19**, **19'** receives high-pressure fluid, assists a spring **39** to push said piston **38** into a blocking position for blocking communication between the isolation valve first inlet **40** and the outlet **17**, said isolation valve piston **38** being returned to the other position by the high-pressure fluid applied by the source **30** to said isolation valve first inlet **40**, when the two isolation valve control inlets **41**, **41'** are connected to the drain-pipe **6**, which connects said first inlet **40** to the outlet **17** of said isolation valve **18**.

4,217,811

LASH COMPENSATOR FOR POWER STEERING GEAR

Donald L. Dzioba, Frankenmuth, and Dennis C. Eckhardt, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1978, Ser. No. 945,649
Int. Cl.[3] F15B *9/10*; F01B *9/00*
U.S. Cl. 91—375 A **4 Claims**



1. A lash compensator between an externally helically threaded worm and an internally helically threaded nut having flank clearance therebetween comprising:

transversely oriented plunger means carried by said nut and extending through a wall thereof at the root between adjacent threads and engageable with the crest of a thread on said worm;

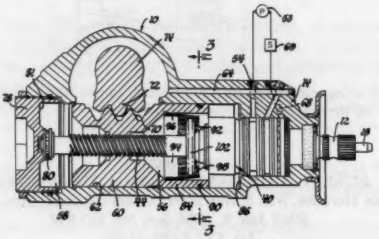
said nut having an external rack thereon, a rotatable input member operatively connected to said worm, and a sector gear engaging said rack having one tooth engageable with said plunger means when said sector gear is centered on said rack so as to impose a friction load on said worm and preclude movement of the worm relative to said nut through said flank clearance upon rotation of said input member when the sector gear is centered on said rack.

4,217,812

INTEGRAL POWER STEERING GEAR WITH VALVE REACTION DEVICE

James P. Byrne, Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1978, Ser. No. 945,650
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 A **3 Claims**



1. A power steering gear comprising a housing, an input mounted for turning movement in said housing, an output leading from said housing, piston means drivingly connected to said output mounted for longitudinal sliding movement in said housing and cooperating therewith to provide a pair of expansible and contractible fluid pressure chambers, rotatable threaded means extending axially through said piston means and being threadedly connected thereto, said threaded connection having lash accommodating small angular movement of said threaded means without corresponding movement of said piston means, a source of fluid pressure, valve means in said housing for controlling the flow of pressure fluid between said chambers and said source, said valve means comprising first and second valve members, said first valve member being connected to said input and said second valve member being connected to said threaded means, said first valve member being relatively rotatable with respect to said second valve member when said second valve member is held stationary relative to said first valve member to control the supply and exhaust of fluid to and from said chambers, and spring means operatively connected between said piston means and said threaded means to provide a yielding reaction force to hold said second valve member stationary with respect to said first valve member in response to the initial turning of said input so that said valve means is actuated as lash is being taken up in said threaded connection to hydraulically connect one of said chambers with said fluid pressure source for the hydraulic assist movement of said piston means and said output.

4,217,813

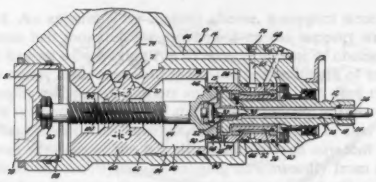
POWER STEERING GEAR WITH DELASHED PISTON NUT AND SCREW THREADING

Arthur W. Bradley, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1978, Ser. No. 945,786
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 A **3 Claims**

1. A power steering gear comprising a housing, an input

member and an output member, said input and output members operatively mounted for turning movement in said housing, piston means drivingly connected to said output member mounted for longitudinal sliding movement in said housing and cooperating therewith to provide a pair of fluid pressure chambers, said piston means having an internal opening extending axially therethrough, a helical thread on the wall of said opening, a rotatable screw having a cylindrical shank portion extending through said opening, said shank portion having a helical thread that meshes with the thread of said piston means, valve means for controlling pressure fluid from a source of fluid pressure to said pressure chambers, said valve means comprising first and second valve elements, said first valve element being retarded from rotation by connection to said output member through the threaded connection of said piston means and said shank portion, said second valve element being



operatively connected to said input member and rotatable relative to said first valve element in response to rotation of said input member so that said valve means controls the supply and exhaust of pressurized fluid to and from said chambers for the hydraulically powered movement of said piston means, said shank portion being axially slotted so that said shank portion has a radially expanded and outwardly sprung central portion, said central portion providing a reduced lash fit with said piston means by the inward constriction of said central portion by the piston means threaded thereon to thereby permit the immediate relative movement of said valve elements in response to turning movement of said input member, and elastomer seal means supported by said central portion of said shank portion for engaging the helical thread in the wall of said opening for hydraulically sealing said fluid pressure chambers with respect to one another.

4,217,814

DUAL ACTION TRIP AND CONTROL VALVE

Richard F. Wood, Jr., Moorestown, N.J., assignor to DeLaval Turbine, Inc., Trenton, N.J.

Filed Apr. 7, 1978, Ser. No. 894,425
Int. Cl.[2] F15B *11/08, 13/04*
U.S. Cl. 91—453 **8 Claims**

1. A control and safety trip valve in combination with a machinery control element and a source of pressurized fluid comprising:

a valve housing;

a valve spool movably mounted within said valve housing, said valve spool being movable in first and second directions in said housing, said valve spool including a pressure responsive spool portion and a flange portion having opposed pressure responsive faces, said pressure responsive spool portion and one of said opposed pressure responsive faces defining a space therebetween, said flange portion being mounted on said spool portion for engaging a stop means on said spool portion;

means externally operable for moving said valve spool in said first and second directions within said valve housing;

first port means communicating said source of pressurized fluid to said valve housing to the space between said valve spool portion and said flange portion, said pressurized fluid operatively coupling said valve spool portion and said flange portion by engagement of said flange portion with said stop means to permit said flange portion and said valve spool portion to move as a unit in said first and second directions;

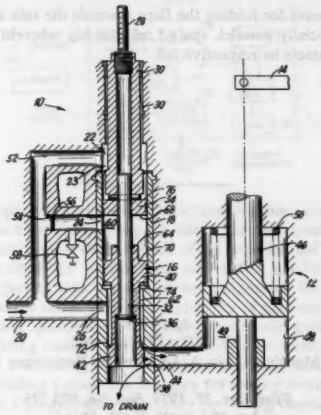
a cylinder housing a power piston operably coupled to said machinery element for actuating same, said power piston being biased by means in a first direction;

second port means communicating said source of pressurized fluid to said valve housing adjacent to said flange portion and acting on the other of said opposed pressure responsive faces;

third port means in said valve housing adjacent to said flange portion permitting communication of said pressurized fluid from said valve housing to said cylinder;

drain means for receiving said pressurized fluid;

said flange portion when moved in said first direction by said valve spool operatively coupling said second port means



to said third port means to permit fluid flow to said cylinder to thereby move said power piston in a direction opposed to said bias;

said flange portion when moved in said second direction by said valve spool connecting said drain means to said power piston to thereby move said piston in the first direction in response to said bias;

means coupled to said first port means to decrease the pressure in said valve housing in the space between said valve spool and said flange portion to operatively de-couple said valve spool from said flange portion and to rapidly move said flange portion in said second direction responsive to pressure acting on said other opposed pressure responsive face to rapidly dump said fluid from said power piston to said drain means to permit said piston to move rapidly in said first direction in response.

4,217,815

MACHINE FOR ERECTING STRAWBERRY LUG

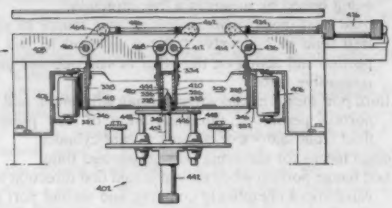
Ulrich G. Nowacki, Leisure City, Fla., assignor to International Paper Company, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,703
Int. Cl.[3] B31B *1/26*
U.S. Cl. 93—37 R **12 Claims**

1. In a machine for erecting a shipping container tray from a blank, said tray having at least one hollow divider wall formed by (a) a transverse bridge, (b) first and second flaps hingedly connected to and downwardly extending from the transverse bridge, and (c) first and second tabs hingedly connected to and upwardly extending from the bottom of the tray, the first flap being secured by securing means to the first tab and the second flap being secured by securing means to the second tab, apparatus for forming the wall, comprising:

(a) means for folding the tabs towards the bridge into a

substantially parallel, spaced relationship wherein the tabs are substantially perpendicular to the portion of the blank that forms the tray bottom; and



(b) means for folding the flaps towards the tabs into a substantially parallel, spaced relationship wherein each flap contacts its respective tab.

4,217,816

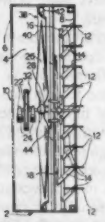
VENTILATING FANS

Vittorio Mancinelli, Via A. Guglieri 23, Borgomaro (Imperia), Italy

Filed Dec. 27, 1978, Ser. No. 973,775

Int. Cl.[2] F04D *25/08, 25/14*

U.S. Cl. 98—116 **4 Claims**



1. A tubed axial ventilating fan, comprising a casing which defines an air flow passage having an air flow inlet and an air flow outlet, an electrically driven fan impeller, said fan impeller being carried by an impeller shaft which is rotatably mounted within said casing, a plurality of simultaneously operable pivotable louvers which are disposed in said air flow outlet, spring means between said louvers and said casing for biasing said louvers to a closed condition, and centrifugal governor means which are driven by said fan impeller for causing said louvers to displace to an open condition, against the bias of said spring means, during fan operation, said centrifugal governor means comprising a governor body mounted on said shaft, at least two weights pivotally connected to said body and symmetrically disposed with respect to said shaft, a reciprocable element which is reciprocally mounted on said shaft and connected to said weights by means of pivoted elements and an actuating member rotatably mounted on said reciprocable element and connected to one of said louvers for causing all louvers to operate.

4,217,817

PORTABLE APPARATUS FOR RAPID GRILL COOKING

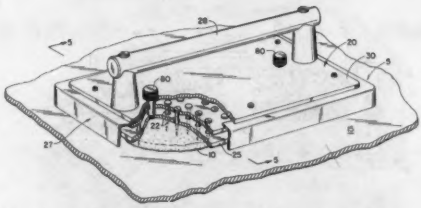
Jon F. Meamber, Redding, Calif., assignor to Fast Food Fabricators, Inc., Redding, Calif.

Continuation-in-part of Ser. No. 772,286, Feb. 15, 1977, Pat. No. 4,170,933, which is a continuation-in-part of Ser. No. 732,542, Oct. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 683,373, May 5, 1976, abandoned. This application Oct. 27, 1978, Ser. No. 955,430

The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.

Int. Cl.[2] A47J *37/06, 43/8*

U.S. Cl. 99—349 **8 Claims**



1. A portable self-cleaning device for cooking slabs of meat at an arbitrary position on a grill in a reduced time, comprising:

a weighted member;

piercing means mounted to the weighted member wherein the weight of the weighted member is sufficient to urge the piercing means through slabs of meat positioned thereunder;

skirt means mounted to the weighted member and at least partially surrounding the piercing means to protect the piercing means from damage;

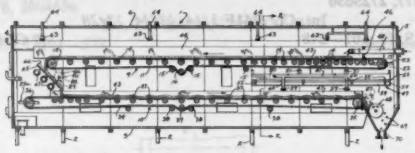
heat conductive pressure means engaged with the piercing means and freely movable relative to the weighted member toward and away from the grill surface, the pressure means being devoid of spring coupling to the weighted member so as not to affect the weighted member's urging the piercing means through the slabs, the pressure means being of sufficient weight to clean the piercing means and disengage meat slabs from the piercing means by gravity alone independently of the weighted member when the device is lifted away from the grill; and

carriage means for maintaining the pressure means in engagement with the piercing means when the device is lifted away from the grill, but allowing the pressure means to assume a position in contact with the grill such that the piercing means and the pressure means contact the grill when the device is placed directly on the grill, in which position the grill directly conductively heats the pressure means and the piercing means, and further heats the weighted member through the piercing means, such that subsequent placement of the device over the slabs causes the weighted member to urge the piercing means through the slabs to cook the slabs partially from within, and causes the pressure means to contact the surface of the slabs remote from the grill to cook the slabs partially from above and to urge the slabs into intimate contact with the grill, the skirt means serving to prevent the escape of heated air and moisture from the vicinity of the cooking slabs.

4,217,818
CHEESE MAKING APPARATUS

Gretz L. Hazen, Fort Atkinson, Wis., assignor to DEC International, Inc., Madison, Wis.

Division of Ser. No. 683,830, May 6, 1976, Pat. No. 4,089,243.
This application May 15, 1978, Ser. No. 906,065
Int. Cl.[2] A01J *11/00*
U.S. Cl. 99—456 18 Claims



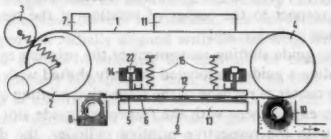
14. An apparatus for making cheese, a support structure, a porous belt mounted for movement on the support structure and having a conveying run to receive a layer of cheese curds and whey, drive means to move the belt in a path of travel, a plurality of spaced support rolls journalled for free rotation with respect to the support structure and disposed transversely to the direction of travel of said belt to support said belt in travel, portions of the belt disposed between adjacent spaced rolls in the conveying run sagging downwardly from a plane extending between the upper extremities of said adjacent rolls so that the belt travels in a fixed undulating path to provide a stretching action for the layer of curds and drain the whey through the porous belt.

17. A method of processing cheese curd, comprising the steps of mounting an endless porous belt for travel in a conveying run and a return run, supporting the conveying run of the belt by a series of spaced rolls, sagging the belt downwardly in the spaces between adjacent rolls from a plane passing through the upper extremities of adjacent rolls so that the belt travels in the conveying run in a fixed undulating path, feeding a mixture of cheese curd and whey onto the conveying run of the belt, and advancing the belt to cause the mixture to move in said undulating path to stretch the mass of cheese curd and drain the whey through the porous belt.

4,217,819
DEVICE FOR THE TRANSFER PROCESS OF CHARACTERS, CONSISTING OF TONER, THAT ARE APPLIED TO A CONTINUOUSLY ROTATING BAND-SHAPED INTERMEDIATE CARRIER

Wolfgang von Tluck, Olching, and Bernhard Schlageter, Ottobrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,187
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750612
Int. Cl.[2] G03G *15/00*
U.S. Cl. 101—1 14 Claims



1. A device for use during the transfer of toner characters to a recording carrier, comprising:

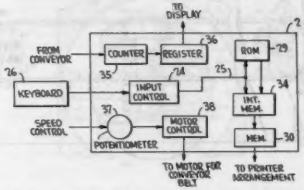
an intermediate carrier, said intermediate carrier comprising a continuously rotating two surface elastic band disposed adjacent the recording carrier and bearing toner characters on the surface which faces the recording carrier; and

clamping means for temporarily clamping said band to the recording carrier during the transfer process so that the area of the band which is in contact with the recording carrier comes to a temporary standstill.

4,217,820
APPARATUS FOR PRINTING ON TRANSPARENCY SLIDES

Johannes Lorsch, An der Bleiche 49, D-4172 Straelen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 646,561, Jan. 5, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,228
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1975, 2500634
Int. Cl.[2] B41J *7/70*
U.S. Cl. 101—93.05 4 Claims



1. An apparatus for printing characters on slides, comprising a guide track for transporting the slides; constant speed driver means engaging said slides outside of the areas thereof that are to be inscribed for transporting said slides; needle printer means projecting into the area of said guide track for contact printing on the slides, including a plurality of pins movable up to and fitting against the slide guided past in said guide track, said pins being constrained against lateral movement; control means for controlling said needle printer means; said control means including a read only memory for storing desired characters; and a programmable memory for storing characters fed thereto from the read only memory via a keyboard, said programmable memory triggering said needle printer means; and an intermediate memory connected between said control means and said programmable memory, said intermediate memory including a first-in, last-out memory device, said intermediate memory device storing characters from said read only memory fed to said intermediate memory by said control means, said intermediate memory further feeding said stored characters to said programmable memory backward and inverted as a result of the first-in, last-out storage of said characters.

4,217,821
PRINTING APPARATUS UTILIZING FLEXIBLE METAL SLEEVES AS INK TRANSFER MEANS

Jacobus-Gerardus Vertegaal, Boxmeer, and Lodewijk Anselrode, St. Anthonis, both of Netherlands, assignors to Stork Brabant B.V., Boxmeer, Netherlands

Continuation-in-part of Ser. No. 864,332, Dec. 27, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,049
Int. Cl.[2] B41F *15/10, 15/38, 27/12*
U.S. Cl. 101—181 8 Claims

1. Apparatus for supporting an imperforate thin walled metal sleeve which is flexible and collapsible when unsupported, for use as an ink transfer device in a printing press or the like which comprises:

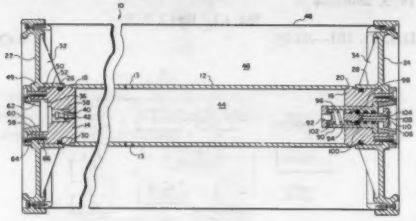
A. an elongate hollow shaft having a plug at opposite ends thereof and lateral passageways through the shaft wall between the ends thereof,

B. each of the plugs having structure to enable the apparatus to be removably coupled to a printing press and be rotated by the press drive on an axis defined by the axis of the hollow shaft,

C. an imperforate disc connected to each of the plugs coaxial with said shaft and having a circumferential groove on its

face located radially inward of its outer edge, the diameter of the grooves being substantially greater than the outer diameter of the hollow shaft, said grooves facing one another axially and providing seats for the ends of said thin walled metal sleeve adapted to be engaged therein and extending between said discs spaced outwardly of said hollow shaft,

D. an elastomeric O-ring engaged in each groove and a locking ring also axially movable into said groove and adapted to engage said O-ring and press same into its groove whereby to clamp the ends of the thin walled



sleeve into the respective grooves while forming said ends into circles coaxial with said shaft,

E. said apparatus providing no support for the said sleeve when so installed between the clamped ends thereof other than fluid pressure,

F. means for securing the locking rings in said clamped engagement and

G. a valve in at least one of said plugs to enable the admission of fluid under pressure into the interior of the sleeve when said sleeve is so mounted in said apparatus, the valve being arranged to retain the fluid pressure in the apparatus.

4,217,822

COLOR PRINTING METHOD

Donald D. Milligan, Melbourne, Australia, assignor to Triprint Pty. Ltd., Victoria, Australia

Filed Aug. 7, 1978, Ser. No. 931,750

Int. Cl.[2] B41C *1/12;* B41M *1/14*

U.S. Cl. 101—211 **11 Claims**

1. A half-tone primary color printing method where the black color is approximated by balancing the primary color components of the print and where the printing process involves using three primary color printing passes only, comprising the steps of:

(a) preparing separated, differentially angled screen images of the primary color and black components of the print;

(b) reducing the dot sizes of the screen images corresponding to the respective red, blue and yellow components of the combination plates prior to the combining of each image with its respective black component;

(c) preparing combination primary color and black half-tone printing plates using the prepared screened primary color images having reduced dot sizes as the primary color component image of each combination plate;

(d) printing the final color image using said plates and primary color inks; and

(e) maintaining the density and volume of said inks during said printing process within a range suitable to maintain optimum color density in the final half-tone image despite the reduction of dot sizes of the primary color components of each printing plate;

characterised by the improvement comprising increasing the density of the black component screen image by up to 50% prior to combination with said primary color screen images whereby the appearance of the half-tone color work is enhanced.

4,217,823

DRIVE ARRANGEMENT FOR A CHANGEABLE SATELLITE PRINTING MECHANISM

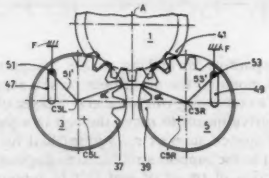
Rainer Burger, Augsburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft (M.A.N.), Augsburg, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,784

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725030

Int. Cl.[3] B41F *5/14, 13/14, 13/28*

U.S. Cl. 101—248 **9 Claims**



1. Drive arrangement for a changeable printing mechanism adapted for cooperation with another printing mechanism, of a rotary printing machine having

a frame (F);

a counter cylinder (1);

counter cylinder gears (41) on said counter cylinder; at least two printing cylinders (3, 5) carrying subject matter;

means (25, 27) movably journalling the shaft (25) of said cylinders for movement with respect to the frame, the counter cylinder (1) being common to said printing cylinder;

drive means including a gear (37, 39, 43, 45) on said printing cylinders and comprising, in accordance with the invention,

means selectively coupling said at least two printing cylinders and gears thereon

(a) with the counter cylinder and the counter cylinder gear, or

(b) with each other while uncoupled from the counter cylinder,

by lateral shifting of the axes of rotation of the printing cylinders and rotation of the respectively shifted printing cylinders in respectively opposite direction to maintain registration of predetermined reference points on the printing cylinders and the counter cylinders, respectively, including

means (47, 49) forming a guide slot located laterally shifted with respect to the center of rotation of the respective printing cylinder; and

means to guide shifting movement of the printing cylinders including a guide pin located laterally shifted with respect to the center of rotation of the respective printing cylinder and in engagement with the respective guide slot associated with the respective printing cylinder, the distance between the respective guide pin (51,53) and the center of rotation of the respective cylinder forming a crank arm, whereby the coupling of the respective printing cylinder by the respective guide pin means with the respective guide slot will cause controlled rotation upon movement of the movable journaling means, in mutually opposite sense against each other and permit engagement and meshing of the respective gears on said printing cylinders, and the counter cylinder gear, respectively.

4,217,824

DETACHABLE GAP COVERING ON CYLINDERS OF PRINTING PRESSES

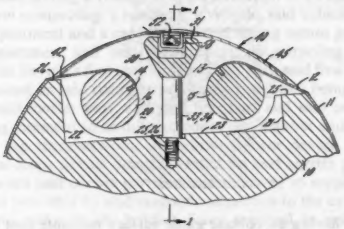
Herbert Rebel, Rodgau, and Claus Simeth, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 31, 1979, Ser. No. 8,099

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804556

Int. Cl.³ B41F 27/06, 13/42

U.S. Cl. 101—375 4 Claims



1. In a cylinder of a printing press having a longitudinal channel forming a gap in the cylindrical surface, a gap cover made of a single sheet of thin material formed into accurate cross section to present a surface which is substantially flush with the surface of the cylinder and dimensioned to bridge the gap with its lateral edges extending to lands along the lateral edges of the gap, first and second fastening assemblies accommodated below the presented surface of the cover and axially spaced along the center of the gap, the first assembly including a hook and a registering stirrup for receiving the hook, the hook and stirrup being interposed between the cover and the cylinder to secure the cover in position on the cylinder, the hook being axially oriented so that when the tip of the hook is registeringly engaged and the cover is shifted axially the hook moves relatively into seated position in the stirrup accompanied by shifting movement of the cover into axial register with the cylinder, the second fastening assembly including a latching element having a radially oriented shaft in the cylinder and having at its outer end a flat head of oblong profile forming a pair of wings, means for mounting the latching element so that at least the head thereof is rotatable, the cover having a recessed portion radially aligned with the latching element, the recessed portion containing an aperture of mating oblong profile laterally bounded by land surfaces so that, when the cover is in axial register with the cylinder and the head is in rotational register with the aperture, the head of the latching element may project through the aperture into the recess, means for applying a turning tool to the head to turn the latching element substantially 90 degrees so that the head moves from its rotationally registered free position to a locking position in which the wings of the head overlie the land surfaces thereby locking the cover in place, the shaft of the latching element having an associated detent for snapping the head from its free position to its locking position and for securely holding it there until intentionally released upon application of additional turning movement.

4,217,825

ASSEMBLY FOR CLAMPING AND TIGHTENING A BLANKET OVER A BLANKET CYLINDER IN A PRINTING PRESS

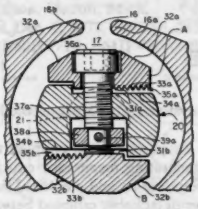
Carl H. Bruckner, Bensheim-Auerbach, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,159

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1978, 2828747

Int. Cl.³ B41F 27/06, 7/22

U.S. Cl. 101—415.1 3 Claims



1. A blanket cylinder construction for clamping and tightening a flexible blanket having straight ends comprising, in combination, a cylinder body having a narrow axial slot in its surface in centered relation to an undercut longitudinal recess, a longitudinal shaft in such recess journaled at the ends of the cylinder for rocking movement, a first clamping bar extending flatly along one side of the shaft and forming with the shaft a first pocket along one of its edges presenting a first roughened surface for receiving and engaging one end of the blanket when rocked to a first blanket-accepting position, a second clamping bar extending flatly along the opposite side of the shaft and forming with the shaft a second diametrically arranged pocket presenting a second roughened surface for receiving and engaging the opposite end of the blanket when rocked to a second blanket-accepting position, the first clamping bar having a first set of clamping screws for clamping the first clamping bar to the shaft and operable by a tool inserted through the slot when the first clamping bar is rocked into an aligned tool-accepting position with respect to the slot, the second clamping bar having a second set of clamping screws for clamping the second clamping bar to the shaft, the second set of screws penetrating both the first clamping bar and the shaft, the clamping screws all being faced in the same direction so as to be operable from the same direction by the tool inserted through the slot when the first clamping bar is again rocked into alignment with the slot, and means coupled to one of the ends of the shaft for rocking the shaft into its blanket-accepting and tool-accepting positions for finally rocking the shaft in a direction to wind up the ends of the blanket thereon for tensioning the blanket about the cylinder surface, said rocking means including means for locking the shaft in its blanket-tensioning condition.

4,217,826

TIME DELAY FIRING DEVICE

Charles Young, Jr., and Gee-In Goo, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 18, 1978, Ser. No. 935,181

Int. Cl.³ F42C 11/06, 19/06

U.S. Cl. 102—200 5 Claims

1. A firing device for initiating ordnance elements and systems after a preselected time delay comprising:

electronic oscillator means of known predetermined frequency for generating a series of electrical pulses;

means coupled to said electronic oscillator means for counting said predetermined number of pulses;

means coupled to said counting means for presetting a predetermined number of such pulses corresponding to a predetermined time delay;

means coupled and responsive to said counting means for generating an electrical firing signal after said predetermined number of pulses have been counted;

a bottom end plate containing electrical terminals through which said firing signal is made available for coupling to ordnance elements and system to initiate said ordnance

elements and systems after a preselected and preset time delay;

detachable base coupling means, coupled to said electrical firing signal generating means, for causing a detonation explosion in response to said electrical firing signal; and

a training adapter detachably coupled between said bottom end plate and said base coupling means for isolating the explosion generated within said base coupling means from said bottom end plate.

4,217,827

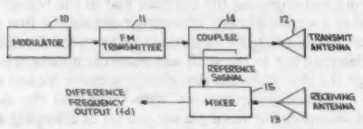
RADAR FUZING SYSTEM

John R. Dent, Fairfax County, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 43,300, Apr. 23, 1970, abandoned. This application Feb. 8, 1973, Ser. No. 331,160

Int. Cl.³ F42C *13/04*

U.S. Cl. 102—214 **3 Claims**



1. A radar fuzing system for distinguishing valid return signals from jamming signals, comprising:

(a) means for transmitting a radar signal to a target;

(b) means for receiving a return signal from said target;

(c) means for deriving a difference frequency signal from said transmitted and reflected signals;

(d) means for shifting the frequency spectrum of said difference frequency signal; and

(e) means responsive to a shift of said difference frequency signal for preventing premature firing of said fuzing system and for firing said fuzing system in response to a valid return signal.

4,217,828

SAFETY DEVICE FOR FUSES

Jean A. Pelousse, Brussels, Belgium, assignor to S.A. PRB, Societe Anonyme, Brussels, Belgium

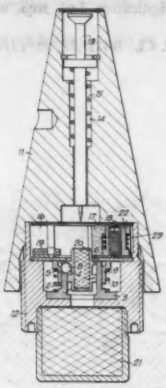
Filed Sep. 8, 1978, Ser. No. 940,756

Claims priority, application Belgium, Sep. 9, 1977, 256225

Int. Cl.² F42C *15/24*

U.S. Cl. 102—249 **4 Claims**

1. Safety device for fuses, of the type which comprises a mobile element, which can be moved from a position of safety in which aforesaid mobile element may be part of the pyrotechnical chain, to obstruct or permit the passage of an element of the fuse towards its active position, characterized by the combining of a tubular bolt having a locking shoulder thereabout, assuring the locking of aforesaid mobile element; of a sheath which at least partially surrounds aforesaid bolt, of balls entered in radial passages provided in aforesaid sheath to engage one side of said shoulder to lock said bolt in an inactive position; of a collar which can move axially by the effect of



inertia and having an oblique guide surface movable past said passages and permit the expulsion of aforesaid balls and to project them along said surface to the other side of said shoulder to lock said bolt in its active position; and of an elastic means which stresses aforesaid collar towards the closing position of aforesaid passages.

4,217,829

SYSTEM AND VEHICLE TO BE HELD MAGNETICALLY

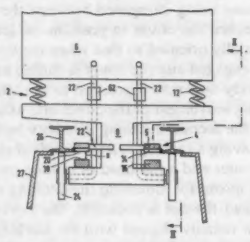
Götz Heidelberg, Am Hügel 16, 8136 Starnberg-Percha, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,767

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711994

Int. Cl.² B61B *13/08*

U.S. Cl. 104—148 MS **29 Claims**



1. A system operating at least partly by magnetic attraction for maintaining a vehicle in spaced relation to a roadway, said system comprising: a roadway, a vehicle, said vehicle having a compartment and a carrier part, and spring means joining said compartment and said carrier part, an attracting magnetic device having a first part and a second part, said first part being mounted on said roadway and said second part being mounted on said carrier part, and said first part and said second part being mounted so as to lié opposite one another and to leave a free gap therebetween, an additional-force device mounted on said carrier part to act between said carrier part and said roadway to supplement the force provided by said magnetic attraction to the extent necessary to make up the holding force

required to maintain said vehicle in said spaced relation, a first piston and cylinder unit mounted between said compartment and said carrier part and adapted to be compressed and extended by displacements of said compartment relative to said carrier part enabled by said spring means, a second piston and cylinder unit mounted between said additional-force device and said carrier part to displace said second part of said magnetic device relative to said additional-force device thereby to vary the width of said free gap, an hydraulic connection interconnecting said first piston and cylinder unit with said second piston and cylinder unit, whereby said displacements of said compartment relative to said carrier part are positively converted into displacements of said second part of said magnetic device relative to said additional-force device thereby to reduce the supplementary force to be exerted by said additional-force device.

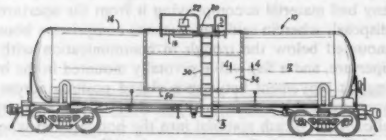
3. A system operating at least partly by magnetic attraction for maintaining a vehicle in spaced relation to a roadway, said system comprising: a roadway, a vehicle, said vehicle having a compartment and a carrier part, and spring means joining said compartment and said carrier part, an attracting magnetic device having a first part and a second part, said first part being mounted on said roadway and said second part being mounted on said carrier part, and said first part and said second part being mounted so as to lie opposite one another and to leave a free gap therebetween, an additional-force device, said additional-force device being mounted on said carrier part to act between said carrier part and said roadway to supplement the force provided by said magnetic attraction to the extent necessaryto make up the holding force required to maintain said vehicle in said spaced relation, a lever articulated on said carrier part, said lever connecting said carrier part and said additional-force device such that by pivotal movement of said lever, said second part of said magnetic device is displaced relative to said additional-force device, thereby to vary the width of said free gap, mechanical connecting means connecting an arm of said lever and said compartment whereby displacements of said compartment relative to said carrier part enabled by said spring means are positively converted into displacements of said second part of said magnetic device relative to said additional-force device thereby to reduce the supplementary force to be exerted by said additional-force device.

4,217,830

COLLAR AROUND TANK CAR DOME AREA

Jack L. Himmelheber, Sr., New Albany, Ind., assignor to SCM Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,775
Int. Cl.³ B61D *5/00*
U.S. Cl. 105—360 **1 Claim**



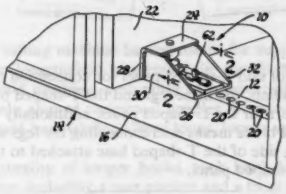
1. For a tank car having a manway and associated fixtures along the top of the car, the improvement, for the transport of vegetable oils capable of polymerization and the removal of which from the sides of the car normally causes corrosion of the exterior surface of the car, comprising a collar having substantially C-shaped configuration and adapted to conform to the exterior upper and side surfaces of the car in an area embracing said manway cover and associated fixtures for protecting said exterior surface from said corrosion, said collar being of thin gauge stainless steel and having apertures provided therein to receive the manway and associated fixtures, further including axially spaced arcuate marginal frame means welded to the tank car sides for telescopically receiving and holding the longitudinally spaced arcuate edges of the collar between said frame means and the exterior of the car, and longitudinally extending marginal frame means welded on either side of the car for telescopically receiving and holding the lower marginal edges of the collar between said frame means and the exterior of the car, said collar extending downwardly along the tank car sides below the point where said sides commence to turn in underneath the car.

4,217,831

CHOCK DEVICE FOR A TRANSPORTING VEHICLE

Melvin J. Koliba, Plymouth; Clarence D. Oakes, Jr., Troy, and Larry P. Napel, Hamburg, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1978, Ser. No. 965,237
Int. Cl.² B60P *7/10;* **B61D** *45/00;* **B65J** *1/22*
U.S. Cl. 410—121 **2 Claims**



1. A chock device adapted to be fixedly connected to an elongated bar secured to the floor portion of a transporter for preventing cargo from shifting while the transporter is moving, said bar being formed with a plurality of equally spaced oblong holes along its longitudinal length, said chock device comprising a body portion including an upright member for engaging the cargo and a rigidly connected horizontal member for overlying the bar, at least one projection fixed to said horizontal member and having a configuration which allows said projection to be located within one of said oblong holes and substantially fill the latter, a rotatable lock head extending through said horizontal member and adapted to register with and be located in another of said holes in said bar when the horizontal member overlies said bar, said lock head having an eliptical shape which allows the lock head to pass through said another of said holes in said bar when the lock head is in one position and prevents said lock head from being removed from said bar when said lock head is rotated to a second position, a manually operable lever for rotating said lock head between said first and second positions, and cam means for moving said lock head towards said horizontal member so when said lock head is in said another of said holes and is located in said second position the lock head serves to maintain said body portion in firm contact with said bar.

4,217,832

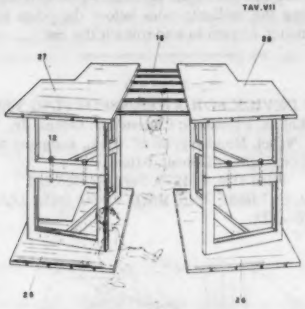
STRUCTURE MADE UP OF SEVERAL COMPONENTS PARTICULARLY FOR USE IN CLASSROOMS

Bruno Pozzan, Via Lungo Leogra 33, Schio (Vicenza), Italy

Filed Mar. 22, 1978, Ser. No. 889,020
Claims priority, application Italy, Mar. 22, 1977, 85551 A/77
Int. Cl.² A47B *87/00*
U.S. Cl. 108—11 **11 Claims**

1. A structure made up of different components, particularly for use in classrooms, which comprises at least two basic elements, each of said basic elements comprising an L-shaped panel and a T-shaped base parallel to said L-shaped panel and three vertical legs connecting said L-shaped panel to said T-shaped base, two of said legs being mounted at the extremity of the short sides of said T-shaped base and one leg being mounted at the extremity of the long side of the T-shaped base, the long side of said T-shaped base being arranged at an angle

with respect to the long side of the L-shaped panel and being totally overlaid by said L-shaped panel, said L-shaped panel having a plurality of blind orifices along the edge located at a modular distance, said T-shaped base being provided with a plurality of orifices, and a plurality of pins for insertion into the



blind orifices of said L-shaped panel for connection of at least two basic elements, the three legs and the T-shaped base being the sole support for the L-shaped panel, additionally comprising a T-shaped brace means interconnecting the legs and parallel to the long side of the T-shaped base attached to the lower face of the L-shaped panel.

4,217,833

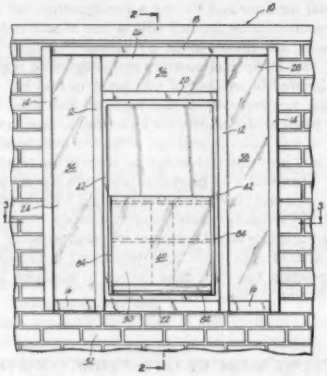
SPECIAL PURPOSE WINDOW

Ronald D. Sukolics, Creve Coeur, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 904,029, May 8, 1978, Pat. No. 4,158,999. This application Mar. 8, 1979, Ser. No. 17,843

Int. Cl.[2] E05G *7/00*

U.S. Cl. 109—19 **14 Claims**



1. An improved special purpose window for use in an exchange between an interior environment and an exterior environment comprising:

a window chamber;

delivery means adapted to sealingly mate with said window chamber so as to divide said window chamber into a first window chamber and a second window chamber, said delivery means including shield means associated therewith so as to divide said delivery means into a first delivery compartment within said first window chamber and a second delivery compartment within said second window chamber, said first delivery compartment including first and second transaction areas at different heights relative to each other and said second delivery compartment including third and fourth transaction areas at different heights relative to each other;

actuating means associated with said delivery means for moving said delivery means between a first position wherein said first delivery compartment is within said first window chamber and said second delivery compartment is within said second window chamber to a second position wherein said first delivery compartment is within said second window chamber and said second delivery compartment is within said first window chamber.

4,217,834

REMOVAL OF ASH FROM FLUIDIZED BEDS

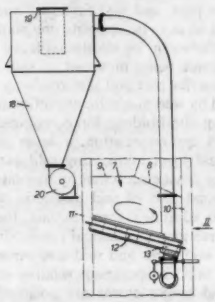
Arnold P. Pearce, London, England, assignor to Flameless Furnaces Ltd., London, England

Filed May 1, 1978, Ser. No. 901,655

Claims priority, application United Kingdom, May 2, 1977, 18354/77

Int. Cl.[2] F23J *1/06*

U.S. Cl. 110—165 R **12 Claims**



1. In a fluidised bed combustion apparatus including a housing and means for supporting and fluidising a bed of granular material in the housing for the combustion of waste or other fuel material, an ash removal means comprising:

an ash trough, arranged along an edge of the means for supporting the bed, for the collection of ash from the bed, comprising at least a bottom wall, and an aperture in the bottom wall for the exit of ash from the trough,

valve means arranged in the aperture for the selective control of the flow of ash through the aperture from the trough,

and pneumatic conveyor means arranged to convey ash and any bed material accompanying it from the aperture for disposal, wherein said valve means comprises a housing, mounted below the trough in communication with the aperture, and a flap valve pivotally mounted in the housing for movement between a closed position across the aperture and an open position clear of the aperture to allow flow of ash material into the housing and wherein said flap valve is formed as an air diffuser and means is provided to supply air under pressure thereto to fluidise ash and any bed material in contact with the flap valve.

4,217,835

DEPTH CONTROL AND SEED BOOT ASSEMBLY FOR TILLAGE APPARATUS

Robert E. Fox, Minburn, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 27, 1978, Ser. No. 955,499

Int. Cl.[2] A01C *5/06, 7/20*

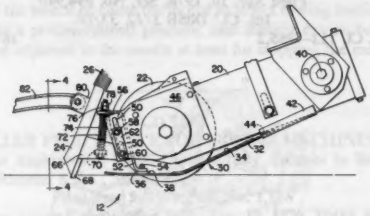
U.S. Cl. 111—85 **14 Claims**

1. In a tillage unit having a cutter wheel for cutting a furrow, a vertical positioning assembly comprising:

adjustable ground-engaging skid means mounted on the unit for controlling the depth of the furrow cut;

seed tube means located rearwardly of the skid means for depositing seeds in the furrow;

tube positioning means connected between the skid means and the tube means for adjusting the latter vertically with respect to the former, the positioning means including a



yieldable member permitting movement of the tube means with respect to the skid means; and

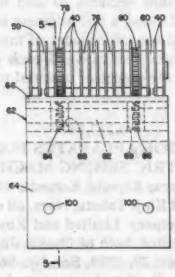
depth control means connected between the unit and the skid means for adjusting the skid means with respect to the unit independently of the adjustments of the tube means to control the depth of the furrow cut while maintaining the vertical position of the seed tube means with respect to the skid means.

4,217,836

ROTARY KNIFE MODULE FOR TUFTING MACHINES

Jimmie D. Scott, Harrison, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Oct. 2, 1978, Ser. No. 947,504
Int. Cl.[2] D05C *15/00*
U.S. Cl. 112—79 R **7 Claims**



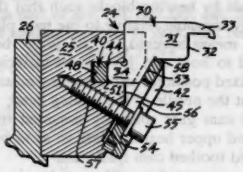
1. A tufting machine having a plurality of reciprocating needles adapted to carry yarn and to penetrate a backing fabric from one side thereof, a loop seizing hook associated with each needle and mounted on the other side of the backing fabric for seizing a loop of yarn presented by the needle to form loops of pile extending from the backing fabric, cutting means associated with at least some of the loop seizing hooks for cutting loops of yarn while on said hooks, said cutting means comprising a module having a plurality of circular knife blades, each cooperating with a respective loop seizing hook, at least one gear member drivingly connected to said knife blades, means for rotatably mounting said knife blades and gear member in said module, a shaft rotatably mounted in said tufting machine, said shaft having at least one drive gear rotatably fixed thereon, means for rotating said shaft, and means for mounting said module in said tufting machine with said drive gear in intermeshing driving engagement with said gear member.

4,217,837

FINE GAUGE LOOPER APPARATUS FOR IN-LINE TUFTING MACHINE

Max M. Beasley, Chattanooga, Tenn.; Leroy A. Defore, and Hugh C. King, both of Dalton, Ga., assignors to Tuftco Corporation, Chattanooga, Tenn.

Filed Apr. 30, 1979, Ser. No. 34,340
Int. Cl.[2] D05C *15/00*
U.S. Cl. 112—79 R **9 Claims**



1. In a tufting machine having means for supporting a base fabric for longitudinal movement in the feeding direction through said machine, a plurality of transversely spaced and transversely aligned reciprocal needles for introducing yarns through said base fabric to form loops, looper apparatus comprising:

(a) a plurality of looper hooks, each hook having a body portion including a rear portion and a front surface, and a tang projecting rearward from said body portion,

(b) a hook bar member having a front face and mounted transversely below the plane of the base fabric for longitudinal reciprocal movement between an operative position below said needles and an inoperative position,

(c) said hook bar member comprising slot means including a plurality of transversely spaced slots having the same gauge as the needles, each slot opening through said front face,

(d) each slot comprising a body slot portion for receiving the body portion of each corresponding hook, and a tang slot portion opening rearward from each corresponding body slot portion for receiving said tang, and

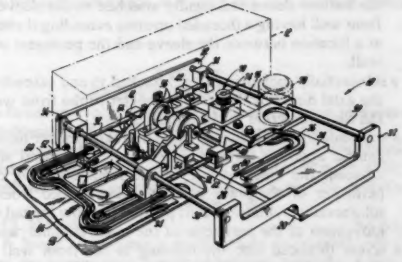
(e) at least one clamp member mounted on said hook bar member for releasably engaging the front surface of the body portions of said hooks received in said slot means to hold said hooks in said hook bar member.

4,217,838

CONTOUR STITCHING APPARATUS FOR USE WITH A SEWING HEAD

Mario Portilla, Sr., 1975 Troy Ave., Brooklyn, N.Y. 11234

Filed Aug. 27, 1979, Ser. No. 69,724
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 **15 Claims**



1. An apparatus for use with a sewing head for making a predetermined stitch pattern in juxtaposed material pieces comprising:

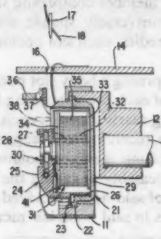
a base plate mounted beneath the sewing head;
toothed cam track fixed to said base plate and configured to conform to the predetermined stitch pattern;
opposed, upstanding support plates secured to the base plate;
a first pair of parallel, support rods extending between said opposed, upstanding support plates;
a second pair of parallel support rods extending perpendicular to said first pair of parallel support rods and connected thereto by bearing blocks;
an upper, bearing plate secured to said second pair of support rods by bearing blocks such that the upper plate is spacially movable relative to the base plate;
clamping means secured to said upper bearing plate and adapted to hold said juxtaposed material pieces in relatively fixed positions, said clamping means being disposed adjacent the needle of the sewing head;
a toothed cam gear rotatably mounted to and depending from said upper bearing plate so as to be in engagement with said toothed cam track; and
drive means mounted on said upper bearing plate and operatively connected to said toothed cam gear whereby rotation of said toothed cam gear by said drive means causes movement of said upper bearing plate relative to said base plate along a path corresponding to the configuration of said toothed cam track.

4,217,839

ADJUSTABLE ANTI-SPILL BOBBIN TENSION SPRING

Benedict W. Barat, Linden, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 6, 1979, Ser. No. 64,315
Int. Cl.³ D05B *57/26*
U.S. Cl. 112—229 **4 Claims**



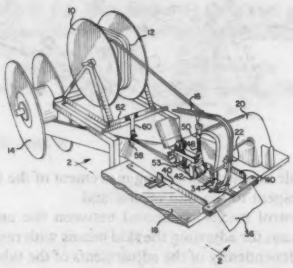
1. A bobbin case for a sewing machine bobbin that comprises a hollow axle and a substantially radial flange at each end of the axle, the bobbin case comprising:
a hollow central sleeve to receive the hollow axle of the bobbin to permit guided rotation of the bobbin on the hollow sleeve;
a front wall extending substantially radially from one end of the hollow sleeve and rigidly attached to the sleeve, the front wall having a threaded opening extending through it at a location between the sleeve and the perimeter of the wall;
a substantially cylindrical skirt attached to and extending in the axial direction from the perimeter of the front wall in the same direction as the hollow sleeve;
a substantially flat, resilient, annular brake member having a central aperture forcibly fitted onto the central sleeve adjacent the inner surface of the front wall, the outer perimeter of the brake member being spaced from the substantially cylindrical skirt portion to allow limited axial movement of the perimeter of the brake member; and
a screw threaded into the opening in the front wall and engaging the surface of the brake member facing the front wall, the screw being adjustable to exert a controllable pressure against the brake member to force the brake member against the end surface of the proximal flange of the bobbin to exert a controllable braking effect on the bobbin.

4,217,840

ZIPPER SEWING ATTACHMENT AND METHOD

Gerald A. Golembeck, Lake Elmo, and Eugene D. Wilwert, Cottage Grove, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

Filed Apr. 10, 1978, Ser. No. 894,940
Int. Cl.² D05B *3/12, 35/06*
U.S. Cl. 112—265.2 **16 Claims**



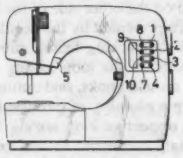
1. In a method for applying a zipper to a length of material, the zipper comprising separate tape sections with each tape section supporting mating teeth along an edge, each tape section being ultimately applied to a separate piece of material whereby the zipper can be utilized to secure the pieces of material together, the improvement comprising the steps of continuously feeding said material to a sewing machine, said material being in an unseparated condition, continuously feeding said tape sections to said machine, locating said tape sections on said material with said teeth supporting edge of each section facing outwardly and with the opposite edge of each section facing inwardly and being positioned adjacent each other, sewing said tape sections to said material, thereafter cutting said material along a line adjacent said opposite edges to thereby form said separate pieces of material, folding said teeth supporting edges back toward each other, and joining said teeth to secure the pieces of material together.

4,217,841

SPEED CONTROL APPARATUS FOR USE WITH ELECTRIC SEWING MACHINE

Toshihiko Daido, Nara; Kiyoshi Koreeda; Hiroshi Kunimatsu, both of Osaka, and Kinji Tabata, Nara, all of Japan, assignors to Koyo Seiko Company Limited and Koyo Machine Industries Company Limited, both of Osaka, Japan

Filed Nov. 29, 1978, Ser. No. 966,158
Claims priority, application Japan, Apr. 6, 1978, 53-40858
Int. Cl.² D05B *69/18*
U.S. Cl. 112—277 **2 Claims**



1. A speed control apparatus for use with an electric sewing machine having motor drive control means for controlling the drive of the motor, said apparatus comprising a sensing device which can be optionally contacted by the operator of the

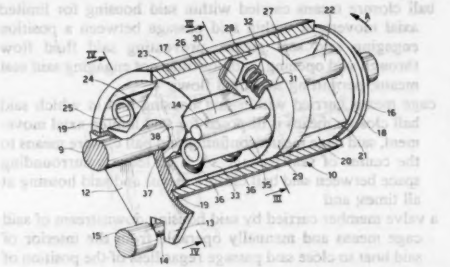
sewing machine, and a sensing signal generating circuit having means to condition the motor in a driven state or condition the motor in a stopped state and latch the motor in the selected state and generate a latch signal in response to an electrical change which is caused when the human body touches said sensing device, the arrangement being such that in response to the operator of the sewing machine touching said sensing device, said sensing signal generating circuit including means for supplying the latch signal to the motor drive control means to drive the motor or cause the motor to stop a sewing machine needle at a predetermined position, said sensing device being provided adjacent to the needle at least for stopping the motor drive.

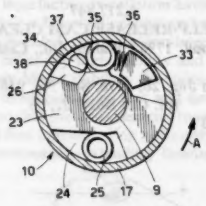
4,217,842

ROLLER FEED DEVICE FOR SEWING MACHINES

Ottorino Anghinoni di Luigi, Corsico, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Jan. 5, 1979, Ser. No. 1,116
Claims priority, application Italy, Jan. 20, 1978, 19455 A/78
Int. Cl.² D05B *27/14*
U.S. Cl. 112—322 **6 Claims**





1. An improved roller feed device for sewing machines having a pair of contiguously disposed feed rollers with an intermittent unidirectional clutch mounted within one of the rollers for effecting incremental advance of a workpiece between the rollers, said roller feed device comprising:

(a) an oscillatably driven control shaft (9);

(b) a drive unit (20,22) rotatably mounted on said control shaft (9) within a cylindrical casing (17) defining one of the feed rollers for rotating the latter a distance corresponding to the limit of advance of the workpiece;

(c) means defining a clamping unit (23,25) assembled on said control shaft (9) and operatively connected to said drive unit for preventing movement of said cylindrical casing (17) reverse that of its direction of feed; and

(d) a braking unit connected to and disposed intermediate said drive and clamping units for effecting a cessation of said units upon completion of advance of a workpiece by said drive unit which includes:

(i) a first disc (27) connected to said drive unit and rotatably mounted on said control shaft (9);

(ii) a second disc (29) operatively connected to said control shaft (9); and

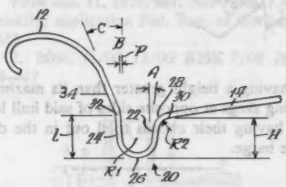
(iii) means interconnecting said first and second discs for effecting stoppage of said casing (17) at a point ahead of the limit of travel of said second disc.

4,217,843

METHOD AND APPARATUS FOR FORMING ENDS

John L. Kraska, Riverside, Ill., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 820,237, Jul. 29, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 968,099
Int. Cl.² B21D *51/44*
U.S. Cl. 113—121 C **14 Claims**



1. A method of forming a container end having a minimum buckle resistance of 90 psi and a minimum rock resistance of 60 psi from a sheet metal material having a maximum thickness of 0.0120 inches comprising the steps of aligning upper and lower die elements for relative movement along a path with said lower die element having an annular recess defined by inner and outer die members movable relative to each other along said path, said inner die member having an inner annular flat wall parallel to said path with an arcuate surface on the upper end of said inner wall having an outer radius less than 0.030 inches, said outer die member having an outer annular flat wall defining an angle of less than 5 degrees with respect to said path, said upper die element having an annular punch having a lower arcuate surface having a radius of approximately 0.030 inches and having a length along said path of more than twice said radius, moving said inner and outer die members relative to each other along said path so that an upper edge of said outer annular flat wall is above an upper free edge of said arcuate surface on the upper end of said inner wall of said recess, inserting said sheet metal material between said die elements, and moving said die elements towards each other to force said punch into said recess and produce a countersink between a substantially flat central portion and a peripheral curl with the countersink having a depth of at least 0.075 inches and an outer flat wall portion in engagement with said outer flat wall of said lower die element, said outer flat wall having a length to locate an upper free edge of said outer flat wall portion above the peripheral lower edge of said central portion and produce an arcuate portion having a radius of less than 0.030 inches between said inner flat wall and said central portion.

4,217,844

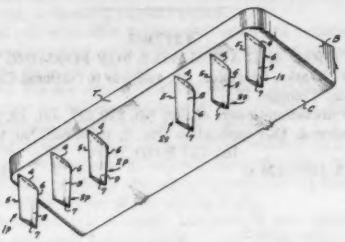
BARGE DAGGER SKEGS

Josip Gruzling, North Vancouver, Canada, assignor to Seaspan Development Co. Ltd., North Vancouver, Canada

Continuation of Ser. No. 802,140, May 31, 1977, abandoned, which is a continuation of Ser. No. 688,014, May 19, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 870,034
Int. Cl.² B63B *1/00*
U.S. Cl. 114—63 **8 Claims**

1. A barge comprising a nonpowered, nonsteered hull designed for towing by a towline trailing a towboat, said hull having a substantially flat bottom and a raked stern counter, a set of skegs projecting downward from the aft portion of said stern counter at each set of the hull longitudinal center line for

effecting yaw stability of said hull, each set including a plurality of skegs arranged in a row extending athwartships of the barge and directionally fixed relative to said stern counter, the lower end of each skeg being higher than the barge bottom and



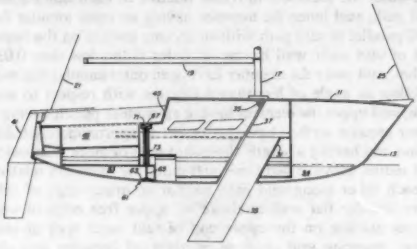
each skeg having a height greater than its maximum chord, corresponding skegs at opposite sides of said hull longitudinal center line having their chords toed out in the direction of travel of the barge.

4,217,845

TRAILERABLE WATER BALLASTED SAILBOAT

Frederick E. Hood, and K. Dietrich Empacher, both of Marblehead, Mass., assignors to Little Harbor Boat Yard Corporation, Marblehead, Mass.

Filed Sep. 25, 1978, Ser. No. 945,541
Int. Cl.[2] B63B *39/03, 43/06*
U.S. Cl. 114—125 **3 Claims**



1. An owner trailerable displacement hull sailboat comprising:

a hull of length about 20 feet and beam about 8 feet including an outer shell contoured to provide, relative to a design waterline,

a V-bottomed displacement hull shape with substantial displacement in relation to wetted surface;

a dismountable mast for supporting sails to drive said hull;

a retractable keel element located at the hull centerline for providing lateral resistance to leeway during sailing;

within said shell, sealed structural wall elements which form, with said shell, a pair of ballast tank spaces, one on either side of the hull with a walkway between them, the essential bulk of the tank spaces being below the design waterline of the hull shape; and

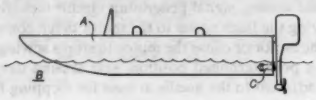
inlet means through the bottom of said shell below said design waterline for filling said tank spaces to admit sea water from outside the shell, the weight of the unballasted boat being sufficient to sink the hull to the design waterline and essentially fill said tank spaces, the V-ing of the hull bottom being such that the waterline beam without ballasting is about 63 inches and the waterline beam when the hull is water ballasted is about 70 inches, whereby ballasting adds substantial form stability to the hull.

4,217,846

BOAT BAILING APPARATUS

Gary E. Wight, 7535 Tanager, Houston, Tex. 77039

Filed Jul. 17, 1978, Ser. No. 925,450
Int. Cl.[2] B63B *13/00, 29/16*
U.S. Cl. 114—185 **6 Claims**



1. Boat bailing apparatus for removing fluid from the interior of a boat comprising:

a tubular housing adapted for attachment to the transom of a boat providing a substantially horizontal passage through which fluid may pass from the interior of said boat to the exterior thereof;

annular seat means centrally disposed near one end of said housing providing an opening through which said fluid may flow from said boat interior and into said passage for exit to said boat exterior;

ball closure means carried within said housing for limited axial movement within said passage between a position engaging said seat means, preventing said fluid flow through said opening, and positions not engaging said seat means, permitting said fluid flow;

cage means carried within said housing and in which said ball closure means is disposed for said limited axial movement, said cage means confining said ball closure means to the center of said passage so as to leave a surrounding space between said ball closure means and said housing at all times; and

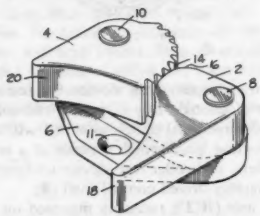
a valve member carried by said housing downstream of said cage means and manually operable from the interior of said boat to close said passage regardless of the position of said ball closure means.

4,217,847

SELF-RELEASE CAM CLEAT

Robert A. McCloud, 17982 Walnut Rd., Castro Valley, Calif. 94546

Filed Jun. 26, 1978, Ser. No. 918,925
Int. Cl.[2] B63B *21/08*
U.S. Cl. 114—218 **5 Claims**



1. A release cam cleat comprising:

a base plate suitable for mounting;

a pair of oppositely disposed cam members, pivotably mounted and spring biased on said plate;

one of said cam members having a non-smooth surface for gripping a rope, the non-smooth surface having a radius of curvature greater than the pivot radius such that said cam surface is eccentric so that upon pivoting in the spring biased direction, the distance between the pair of cam members decreases;

the opposite cam member having smooth gripping and release surfaces and a release lever, said smooth gripping

surface having a radius approximately equal to the pivot radius and being substantially less eccentric than the non-smooth gripping surface and said release surface having a radius substantially less than the pivot radius so as to provide a substantially narrower arc than the smooth gripping surface and said release surface being adjacent said gripping surface in the direction opposite the free end of a gripped rope such that upon pivoting said smooth surface cam member via said release lever in the direction opposite the spring bias, the rope will release upon loss of contact with said gripping surface and contact with said release surface.

4,217,848

FLOATING GAS LIQUEFACTION INSTALLATION

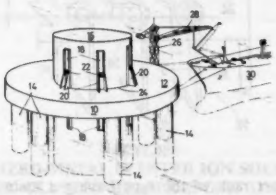
Gerhard D. Meyer-Haake, Hamburg, Fed. Rep. of Germany, assignor to Marine Service GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,888

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2641040

Int. Cl.[2] B63B *21/52, 35/40*

U.S. Cl. 114—264 **17 Claims**



1. Floating gas liquefaction installation having a first floating unit **(12)** supporting a liquefaction unit and a second floating unit **(16)** defining a sealed, thermally insulated tank space, said first unit having relatively high stability and said second unit having a relatively lower stability, the units being associated with each other in such manner that said first unit surrounds said second unit so that the units respond together to wind and wave action, said first unit including a plurality of circumferentially spaced, downwardly-extending floating support members.

4,217,849

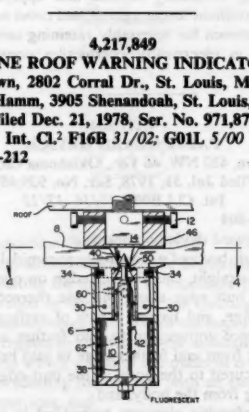
MINE ROOF WARNING INDICATOR

Larry L. Brown, 2802 Corral Dr., St. Louis, Mo. 63010, and Robert G. Hamm, 3905 Shenandoah, St. Louis, Mo. 63110

Filed Dec. 21, 1978, Ser. No. 971,879

Int. Cl.[2] F16B *31/02;* **G01L** *5/00*

U.S. Cl. 116—212 **13 Claims**



1. An underground mine warning device comprising a means for mounting the device upon an attaching meaning contained on the roof of a mine; outwardly extending compressioned arm means for detecting movement of a mine roof which are in communication with said mine roof; activation means for displaying an indicator means upon movement of said compressioned arm means; and on indicator means which indicate movement of said compressioned arm means.

4,217,850

APPARATUS FOR FLAMESCARFING

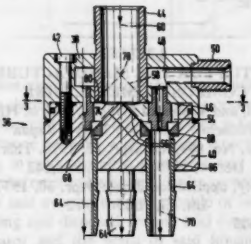
Alfred Lucht, Bickenbach, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,677

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733325

Int. Cl.[2] B05C *11/00, 13/00;* **B23K** *7/06, 26/00*

U.S. Cl. 118—47 **10 Claims**



1. In an apparatus for scarfing the surface of a workpiece with at least one scarfing burner as well as with a powder supply device consisting of a powder container to which a powder distributor is connected, a shut-off valve between said container and said distributor, said distributor being connected via hoses with a powder nozzle associated with the scarfing burner, the improvement being a supply pipe leading from said container and having a plurality of discharge nipples communicating therewith, each of said discharge nipples being in communication with an injector, all of said injectors communicating with a common annular air chamber surrounding said supply pipe, and an air intake nipple leading to said annular air chamber.

4,217,851

TABLET COATING APPARATUS

Raymond J. Biehl, Monsey, and William H. Marlow, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

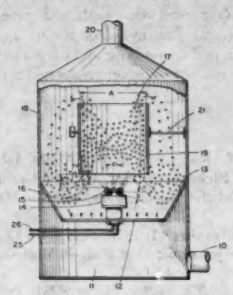
Filed Aug. 27, 1979, Ser. No. 69,674

Int. Cl.[2] A23G *3/20*

U.S. Cl. 118—20 **3 Claims**

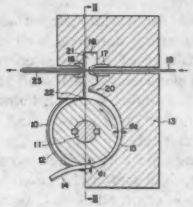
1. An apparatus useful in the application of liquid coating compositions which are essentially free of organic solvents to discrete particles such as pharmaceutical tablets, said apparatus comprising, in combination: a vertically disposed coating chamber containing coating and drying zones; a gas inlet means at the bottom of the chamber adapted to assist drying of the coated particles in the drying zone by providing an upward current of gas through which the particles drop and are adapted to project the particles to be coated upwardly through the coating zone; a spray assembly disposed within said coating chamber below said coating zone, said spray assembly comprising a manifold having a conical upper surface axially disposed within said coating chamber and adapted with three or more atomizing spray nozzles equidistantly disposed on the

conical upper surface of said manifold and means for introducing the coating liquid to said atomizing nozzles for projection



of a regular polylobal atomized spray of the coating liquid in the coating zone.

4,217,852
APPARATUS FOR THE MANUFACTURE OF A COMPOSITE METAL WIRE
Masahiro Nagai, and Yasuhiko Miyake, both of Hitachi, Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan
Division of Ser. No. 899,968, Apr. 25, 1978. This application Dec. 4, 1978, Ser. No. 966,042
Claims priority, application Japan, Apr. 30, 1977, 52/50076
Int. Cl.[2] B05C *3/12*
U.S. Cl. 118—405 **3 Claims**



1. An apparatus for manufacturing a composite metal wire including a metal core wire surrounded by a coating metal of a material different from said metal core wire, said apparatus comprising:

a rotary wheel having therein a peripheral groove;

a fixed shoe block having a fitting surface cooperating with a circumferential portion of said groove to define therewith a narrow passageway having an inlet end and an outlet end;

a fixed stopper portion fitting in said groove to entirely close said passageway and to define said outlet end thereof;

a covering chamber communicating with said outlet end of said passageway;

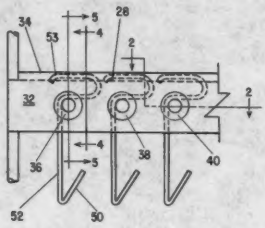
a nipple leading into said covering chamber for guiding thereinto a metal core wire;

a die leading from said covering chamber for defining the outer cross section of a composite metal wire;

whereby feeding of coating metal into said inlet end of said passageway, while rotating said rotary wheel in a direction toward said outlet end of said passageway, subjects said coating metal within said passageway to plastic deformation due to oppositely directed forces including a greater friction force from the surfaces of said wheels defining said groove and a lesser friction force from said fitting surface of said fixed shoe block, and positively carries said coating metal through said passageway by said greater friction force and causes said coating metal to collide with said fixed stopper portion, thereby imparting to said coating metal an extrusion pressure which causes said coating metal to pass into and fill said covering chamber; and

whereby passing of a metal core wire into said nipple through said covering chamber causes said metal core wire to be covered by said coating metal to form a bond therebetween and, due to said extrusion pressure, causes a composite metal wire formed by said metal core wire covered with said coating metal to be extruded through said die.

4,217,853
HANGING RACK FOR FINISHING SYSTEM
Walter E. Davitz, Columbus, Ohio, assignor to Production Plus Corporation, Columbus, Ohio
Filed Apr. 9, 1979, Ser. No. 28,277
Int. Cl.[2] B05C *13/02*
U.S. Cl. 118—500 **10 Claims**



1. A support rack of the type having a main frame and removable workpiece support hooks on which workpieces are hung for transporting the workpieces past a coating station, said rack comprising:

(a) a shielding crossbar having opposed, spaced panels, a cross web extending between and longitudinally along said panels and a crossbeam extending between said panels and spaced from said cross web; and

(b) a support hook having a workpiece engaging portion and a crossbar engaging portion which extends between said panels into engagement with and extending partially around said crossbeam and further extending into engagement against said cross web, said crossbar engaging portion being resiliently flexible and applying oppositely directed resilient forces against said cross web and against said crossbeam for releasably retaining said hook in said crossbar in electrically conductive contact with said crossbar.

4,217,854
PAINT GUARD DEVICE
Claud E. Brown, 432 NW. 46 Ter., Oklahoma City, Okla. 73115
Filed Jul. 31, 1978, Ser. No. 929,459
Int. Cl.[2] B05C *11/16, 17/12*
U.S. Cl. 118—504 **10 Claims**

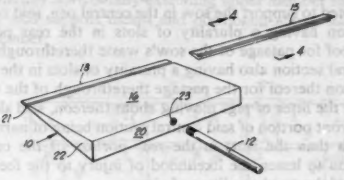
1. A paint guard device comprising:

an elastomeric body of substantially pyramidal configuration having a straight, thin feather edge on one side thereof, having a butt edge along the side thereof opposite the feather edge, and having a pair of surfaces at opposite sides thereof converging to said feather edge and each extending from said feather edge to said butt edge;

a handle secured to the body at the butt edge thereof and projecting from the body; and

flexible, reinforcing elements embedded in said body and cooperating with the elastomer therein to allow selective deformation of said feather edge to a selected curved

configuration by manual deformation of the elastomeric body, followed by retention of said selected curved configuration after said manual deformation, said reinforcing elements including a plurality of elongated wires, including a group of spaced wires disposed in a fan-shaped array with the ends of said wires closest to said butt edge being relatively closer to each other than the ends of said wires relatively close to said feather edge.



4,217,855

VAPORIZED-METAL CLUSTER ION SOURCE AND IONIZED-CLUSTER BEAM DEPOSITION DEVICE

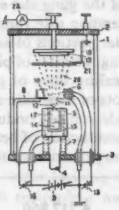
Toshinori Takagi, Nagaokakyo, Japan, assignor to Futaba Denshi Kogyo K.K., Mobara, Japan

Division of Ser. No. 625,041, Oct. 23, 1975, Pat. No. 4,152,478. This application Feb. 13, 1979, Ser. No. 11,917

Claims priority, application Japan, Oct. 23, 1974, 49-129321[U]; Oct. 23, 1974, 49-129322[U]; Jan. 13, 1975, 50-7303[U]; Jan. 13, 1975, 50-7305[U]; Mar. 29, 1975, 50-42658[U]; May 20, 1975, 50-60660; Jul. 15, 1975, 50-86973; Aug. 6, 1975, 50-96461

Int. Cl.[2] C23C *13/08*

U.S. Cl. 118—719 **24 Claims**



1. A film deposition device comprising;
a crucible containing material to be deposited:
means for heating the crucible to vapourize the material:
a nozzle formed in the crucible for ejecting the material vapour therethrough into a high vacuum region to form atom aggregates or clusters by the adiabatic expansion:
a substrate on which a film of the material is deposited:
means for irradiating the clusters with an electron beam to form cluster ions: and
means for accelerating the cluster ions toward the substrate to force a fine quality deposited film.

4,217,856

VACUUM EVAPORATION APPARATUS

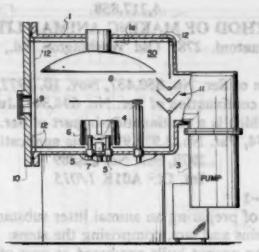
Thaddäus Kraus, Triesen, Liechtenstein, assignor to Balzers Aktiengesellschaft für Hochvakuumtechnik und Dünne Schichten, Liechtenstein

Filed Jun. 27, 1978, Ser. No. 919,546

Claims priority, application Switzerland, Jul. 8, 1977, 008475/77

Int. Cl.[2] C23C *13/08*

U.S. Cl. 118—724 **7 Claims**



1. A vacuum evaporation apparatus, comprising, a housing having walls defining an evacuable evaporation chamber, an evaporator disposed in said housing which is heatable to evaporate a substance thereon, a supporting structure disposed in said housing in said chamber overlying said evaporator for supporting substrates to be coated, and a screen heatable independently of said evaporator and capable of heating the walls of said housing and disposed around said evaporator between said evaporator and the walls of said housing, said screen defining a limiting aperture between said evaporator and said supportive structure limiting radiation to an angle of a size sufficient only for the vapor deposition on the substrate.

4,217,857

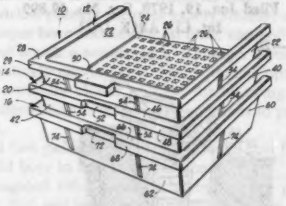
PET RELIEF STATION

Joseph D. Geddie, Norman, Okla., assignor to M.H.G., Inc., Oklahoma City, Okla.

Filed Apr. 24, 1978, Ser. No. 898,723

Int. Cl.[3] A01K *29/00*

U.S. Cl. 119—1 **10 Claims**



5. An improved pet relief station for supporting pet litter material, the station comprising:
a receiving pan having a litter supporting bottom portion and upwardly extending side walls, the bottom portion and side walls cooperating to form a container cavity;
a plurality of spatially disposed stand-off ribs extending outwardly from the side walls of the receiving pan;
a screen pan having a screen bottom portion and upwardly extending side walls, the screen bottom portion having a plurality of openings therein, the openings being sized to retain pet solids thereon while permitting the pet litter to pass therethrough; and
a plurality of spatially disposed stand-off ribs extending outwardly from the side walls of the screen pan, the screen pan positionable within the container cavity such

that in an assembled position the spatially disposed stand-off ribs of the screen pan engage the side walls of the receiving pan to form substantially unobstructed air flow channels therebetween for providing air ventilation to the litter supporting bottom portion of the receiving pan, the stand-off ribs of the screen pan further cooperating with the side walls of the receiving pan to maintain the screen bottom portion of the screen pan in a spatial relationship with the bottom portion of the receiving pan.

4,217,858

METHOD OF MAKING ANIMAL LITTER

Joseph L. Dantoni, 2787 Old Washington Rd., Westminster, Md. 21157

Continuation of Ser. No. 850,437, Nov. 10, 1977, abandoned, which is a continuation of Ser. No. 694,347, Jun. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 504,870, Sep. 11, 1974, Pat. No. 3,972,971. This application Mar. 20, 1979, Ser. No. 22,289

Int. Cl.[2] A01K *1/015*

U.S. Cl. 119—1 **1 Claim**

1. Method of preparing an animal litter substantially free of pesticides, resins and tars, comprising the steps:

(a) obtaining peanut hulls produced as part of a plant root system;

(b) pulverizing said obtained peanut hulls in a hammermill to a size passing a ¼ inch screen;

(c) receiving and treating pulverized peanut hulls from the hammermill with live steam;

(d) agitating the live steam treated peanut hulls and producing a soft pliable mass of material not more than 50% moisture by weight;

(d) further heating and sterilizing and drying the soft pliable mass of material by forcing same through a pelleting die; and

(f) cutting, cooling and drying to a moisture content of less than 18% and a density of 50 to 90 pounds per cubic foot the pelletized material forced through the die; thereby preparing an animal litter substantially free of pesticides, resins and tars.

4,217,859

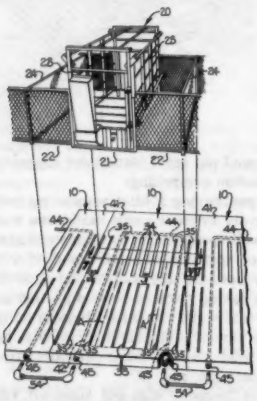
SLOTTED FLOOR SECTION WITH BUILT-IN MEANS ADAPTED FOR HEATING LITTER IN FARROWING HOUSE

William T. Herring, P.O. Box 181, Newton Grove, N.C. 28366

Filed Jun. 19, 1979, Ser. No. 49,899

Int. Cl.[3] A01K *1/02*

U.S. Cl. 119—20 **6 Claims**



4. An integral slotted floor section, commonly referred to as a gang slat, adapted to underlie and serve as the floor for supporting a farrowing crate having a central pen for confining a sow therein and side pens extending along opposite sides of the central pen for confining a newborn litter of pigs in close proximity to the sow, and comprising

a central section formed from reinforced concrete and adapted to support the sow in the central pen, said central section having a plurality of slots in the rear portion thereof for passage of the sow's waste therethrough, said central section also having a plurality of slots in the front portion thereof for the passage therethrough of the waste from the litter of pigs moving about thereon, said slots in the front portion of said central section being of narrower width than the slots in the rear portion of the central section to lessen the likelihood of injury to the feet and legs of the newborn litter of pigs;

opposing side sections also formed from reinforced concrete and integrally with said central section, said side sections extending along opposite sides of said central section and being adapted to support the litter in the side pens, said side sections also having a plurality of slots therein for passage therethrough of the waste from the litter of pigs, said slots in said side sections also being of narrower width than the slots in the rear portion of said central section to further lessen the likelihood of injury to the feet and legs of the newborn litter of pigs;

adjacent slots in each of said central and side sections defining respective substantially parallel, longitudinally extending concrete slat portions therebetween with at least certain adjacent slots in said side sections being spaced further apart than adjacent slots in said central section so that the slat portions defined between said certain adjacent slots of the side sections are relatively wider than the slat portions of said central section;

an end section also formed from reinforced concrete and integrally with said central and side sections, said end section being positioned adjacent said central and side sections and defining the rear end of said gang slat adapted to be positioned entirely exterior to the associated farrowing crate for serving as a rear side aisle floor; and

conduit means embedded within only said side sections and said rear end section of the gang slat for circulation of a heated fluid therethrough so as to aid in maintaining surfaces of said side sections in a warm condition while thus avoiding applying heat to the sow,

said conduit means including longitudinally extending side runs to conduit embedded in and extending longitudinally of only said relatively wider slat portions of said side sections and a transverse run of conduit embedded in said rear end section of the gang slat and interconnecting said longitudinally extending side runs of conduit so that said relatively wider slat portions of said side sections may be heated for attracting the litter of pigs thereonto conducive to promoting a healthy litter of pigs, and there being at least one of the slots of each side section located between each respective side run of conduit and said central section to minimize conduction of heat from the side runs of conduit to the central section of the gang slat.

4,217,860

DEVICE FOR LATERALLY DEFINING A CATTLE STALL

Martin Gloggler, Memelstrasse 34, D-7910 Neu-Ulm, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,182

Int. Cl.[2] A01K *29/00, 1/00*

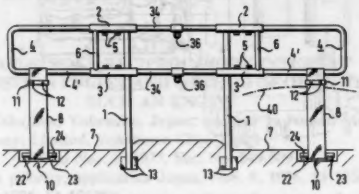
U.S. Cl. 119—27 **14 Claims**

1. A device for laterally defining a cattle stall comprising:

upright support means (1) having a lower end anchorable in a floor of a cattle stall; and boundary means including a bail (4) for defining a lateral boundary of the cattle stall supported by said support means and extending from said support means towards an entrance of the stall, said boundary means including:

a generally horizontally-extending lower member (4') supported by said support means and positionable above the floor at a predetermined height, the height being greater than the height of a prostrate or prone animal occupying the stall;

a generally horizontally-extending upper member supported by said support means and positioned above said lower member;



a flexible belt (8) spaced from said support means and extending from said lower member to the floor of the cattle stall, the belt having a predetermined width sufficiently wide to cover at least two ribs of an animal occupying the stall; and

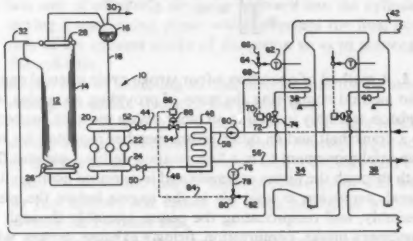
means for connecting a lower end of said belt to the floor of the stall so that said belt protects an animal from injury from contact with said lower member or an adjacent animal.

4,217,861

FLUE GAS REHEAT SYSTEM

Edward J. Angelini, Westfield, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 13, 1978, Ser. No. 960,408
Int. Cl.² F22B *33/18*
U.S. Cl. 122—1 R **4 Claims**



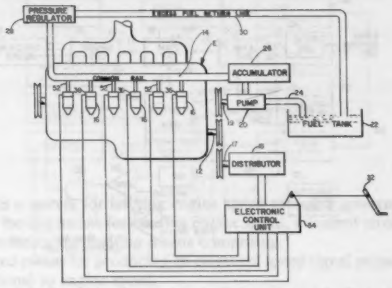
1. In a gas reheating system for a steam generator and a plurality of wet scrubbers, said steam generator having tubes lining a furnace wall and water flowing therethrough, downcomer means arranged to recirculate water from a location downstream of said tubes to a location upstream of said tubes, said wet scrubbers receiving flue gases from said steam generator and discharging the gases to atmosphere, and tubular gas reheating surface located in the stream of discharging gas from each wet scrubber, the improvement comprising: a heat exchanger; means for conveying a low pressure fluid from said heat exchanger to and from each of said gas reheating surfaces; means for circulating the low pressure fluid through said heat exchanger and each of said gas reheating surfaces; and means for circulating high pressure water from said downcomer means through said heat exchanger in heat exchange relationship with the low pressure fluid and for returning the high pressure water to said downcomer means.

4,217,862

HIGH CONSTANT PRESSURE, ELECTRONICALLY CONTROLLED DIESEL FUEL INJECTION SYSTEM

Leonard N. Fort, Burton; Albert F. Albert, Bellevue, and Edward P. Darragh, Kent, all of Wash., assignors to Combustion Research & Technology, Inc., Seattle, Wash.

Filed Mar. 28, 1977, Ser. No. 781,766
Int. Cl.² F02M *39/00, 41/16*
U.S. Cl. 123—472 **29 Claims**



1. Fuel injector mechanism for diesel engines, comprising:

(a) an elongated generally cylindrical injector body member having an upper end and a lower end and an internal plunger bore, said body also being provided with fuel line connection means and first fuel passage means opening into and for admitting fuel under pressure to said bore, said injector body also having a reservoir in the lower portion thereof and opening at said lower end,

(b) an injector tip member having an upper connection end and a lower dispersal end designed to be detachably secured by its connection end to the lower end of said injector body, said tip member having a generally centrally located cavity which opens upwardly so that said body reservoir and tip member cavity together form essentially a common chamber, said tip member having an axial valve stem guide bore extending from said cavity and opening at the dispersal end thereof, said tip member also being provided with at least one fuel delivery channel means extending generally axially parallel with said guide bore from said cavity to said fuel dispersal end,

(c) a cylindrical plunger member axially slidably received in said plunger bore and having an inner end and having an outer end which is connected to a plunger actuator means for operatively moving said plunger into an open position from a normally closed position for allowing fuel from said plunger body first fuel passage means to pass by said plunger,

(d) second fuel passage means for allowing said fuel to pass from said bore to said reservoir chamber,

(e) an elongated valve member having a stem portion extending thru and being axially slidable within said guide bore and having a fuel dispersal head at the outer end thereof, said stem portion extending upwardly through said cavity and into said reservoir chamber and detachably receiving at the upper end thereof a valve retaining and adjustment member including stop means for limiting the downward movement of said adjustment member and said valve stem and having fuel delivery passage means therein for permitting fuel to pass therethrough to said cavity and fuel delivery channels, and

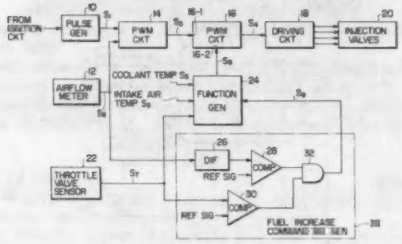
(f) a first spring means in said cavity for resiliently biasing said adjustment member upwardly and above said stop means and also biasing said valve member upwardly to hold said dispersal head against said dispersal end in a normally closed position, and second resilient spring means in said internal bore for biasing said plunger member into said normally closed position.

4,217,863

FUEL INJECTION SYSTEM EQUIPPED WITH A FUEL INCREASE COMMAND SIGNAL GENERATOR FOR AN AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Mitsuhiko Ezoe, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 25, 1978, Ser. No. 945,386
Claims priority, application Japan, Nov. 4, 1977, 52/132205
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—494 **7 Claims**



1. A fuel injection system equipped with a fuel increase command signal generator, for an automotive internal combustion engine, including; means for measuring the airflow rate of the intake air of said engine; means for producing a first pulse signal in response to the ignition pulses of said engine; means for modifying the pulse width of said first pulse signal in accordance with the measured airflow rate for producing a second pulse signal; means for modifying the pulse width of said second pulse signal in accordance with engine parameters for producing a third pulse signal; means for driving fuel injection valves of said engine in accordance with said third pulse signal; means for producing a fuel increase command signal with which the fuel flow rate is increased for a short period of time for compensating for a lean air/fuel mixture supplied to said engine due to overshoot characteristics of said airflow meter; and a throttle valve wherein said means for producing the fuel increase command signal comprising:

(a) first means for detecting the decrease rate of the airflow rate;

(b) second means for detecting the condition of the throttle valve; and

(c) gate means responsive to said first and second means for producing said fuel increase command signal only when the rate of decrease of the airflow is over a predetermined value while the opening degree of said throttle valve is below a predetermined value.

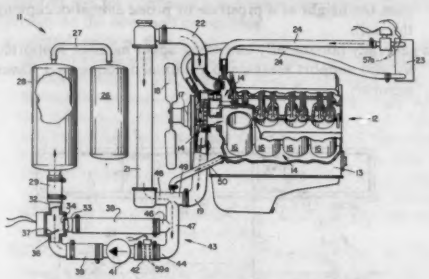
4,217,864

HEATING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Vernon M. Theodore, 1627 Dodge St., Dubuque, Iowa 52001

Filed Nov. 8, 1978, Ser. No. 958,912
Int. Cl.[2] F01P *11/20*
U.S. Cl. 123—41.14 **7 Claims**

1. A heat-assisted starting apparatus for a liquid-cooled internal-combustion engine including a liquid cooling system, an insulated reservoir capable of holding a substantial volume of the cooling system coolant, and coolant-transfer and retransfer means operative in a first cycle for discharging coolant from the cooling system to the reservoir incident to engine shut-down and in a second cycle for charging the cooling system from the reservoir incident to engine start-up, the improvement comprising: an accumulator liquid-connected to the reservoir; pump means serving in the first cycle and connected between the cooling system and the reservoir for discharging coolant from the cooling system to the reservoir and simultaneously pressurizing the accumulator; coolant-charge means connected between the reservoir and operative in the second cycle, independently of the pump means and under pressure stored in the accumulator during operation in the first cycle, for charging the cooling system from the reservoir; and



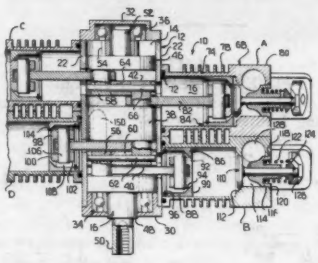
control means selectively operative for selecting between operation in said first and second cycles.

4,217,865

INTERNAL COMBUSTION ENGINE

George M. Barrett, R.R. #5, Galt, Ontario, Canada (N1R 5S6)

Filed Nov. 9, 1977, Ser. No. 849,863
Int. Cl.[2] F01L *11/02*
U.S. Cl. 123—47 A **10 Claims**



1. A method of operating a four stroke cycle internal engine, said method comprising the steps of providing an engine with a piston assembly including an inner piston member connected to a crankshaft and an outer piston member mounted for relative axial movement to in a first position define a gaseous flow path through the piston assembly and in a second position form a seal, supplying at least air to the engine below the piston assembly, and reciprocating the piston assembly through the customary intake, compression, firing a exhause strokes, while maintaining the piston assembly seal during the compression, firing and exhaust strokes and permitting the automatic opening of the gaseous flow path through the piston assembly during the intake stroke, the gaseous flow path being retained opened during the intake stroke by the inner piston member being withdrawn inwardly relative to the outer piston member due to pressure differences between said inner and outer piston members.

3. A new article of manufacture comprising a four stroke cycle internal combustion engine including a piston assembly comprising an inner piston member and an outer piston member, said inner piston member including a head and a base and means for connection to a connecting rod, said inner piston member also including a portion surrounding said head defining a valve surface, said outer piston member including a skirt and an annular head having an opening therethrough of a size less than the cross sectional size of said inner piston member, said annular head having an under surface defining a valve seat

matching said valve surface for forming a seal between said inner piston member and said outer piston member, and retainer means interlocking said inner piston member and said outer piston member for limited relative axial movement and for controlled selected gaseous flow through said opening, said piston members acting as self actuating means for effecting separation of said piston members only during an intake stroke of said four stroke cycle according to pressure differences between said inner and outer piston members.

4,217,866

FOUR-STROKE RECIPROCATORY INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATING SUCH AN ENGINE

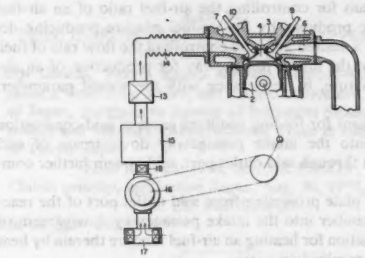
Yasuo Nakajima, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Nov. 7, 1977, Ser. No. 849,509

Claims priority, application Japan, Nov. 8, 1976, 51-133856; Dec. 15, 1976, 51-151381

Int. Cl.[2] F02B *25/00, 41/00*

U.S. Cl. 123—432 **40 Claims**



1. A method of operating a four-stroke reciprocatory internal combustion engine having a cylinder with a piston reciprocating therein, said method comprising:

a first step of admitting air under pressure into the cylinder during a scavenging phase which overlaps the final portion of the exhaust stroke of the piston so as to scavenge the cylinder;

a second step of inducting air fuel mixture into the cylinder during the intake stroke of the piston; and

a third step of admitting air under pressure into the cylinder during a swirl generating phase which overlaps a portion of the intake stroke of the piston which follows said exhaust stroke so that said air under pressure mixes with said air fuel mixture and causes the resultant charge to swirl around the cylinder axis.

13. A four-stroke reciprocatory internal combustion engine comprising:

a cylinder;

a piston reciprocating in said cylinder;

a cylinder head secured to said cylinder to close said cylinder, said cylinder, piston and cylinder head cooperating to form a combustion chamber;

an intake means for inducting air fuel mixture into said cylinder during the intake stroke of said piston;

an exhaust means for exhausting the exhaust gas resulting from the combustion of said air fuel mixture from said cylinder during the exhaust stroke of said piston; and

an additional intake means for admitting air under pressure into said cylinder during a scavenging phase which overlaps the exhaust stroke of said piston, so as to scavenge said cylinder, and for admitting air under pressure into said cylinder during a swirl generating phase which overlaps the intake stroke of said piston so as to swirl said air fuel mixture around the cylinder axis of said cylinder.

4,217,867

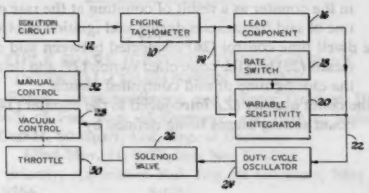
LOW OVERSHOOT ENGINE SPEED GOVERNOR

Wayne A. Madsen, Birch Run; Roland G. Kibler, Flushing, and Jeffrey A. Ely, Flint, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 29, 1979, Ser. No. 43,314

Int. Cl.[2] F02M *7/00*; F02B *33/00*

U.S. Cl. 123—350 **4 Claims**



1. In a system for limiting engine speed to near a governed value having means for limiting engine speed, a control circuit for actuating the limiting means comprising,

speed means for producing an electrical speed signal proportional to engine speed,

a modifying circuit responsive to the speed signal for producing a control signal for energizing the limiting means as a function of engine speed, the modifying circuit including a lead circuit providing a lead term in accordance with engine acceleration, and a variable sensitivity integrator in parallel with the lead circuit, each providing components of the control signal,

the variable sensitivity integrator connected to the speed means and selectively placed in a low sensitivity mode effective during low engine acceleration and in a high sensitivity mode effective during intermediate and high engine acceleration, the integrator including sensitivity adjustment means, and rate means connected to the speed means and responsive to the engine acceleration and connected to the sensitivity adjustment means of the integrator for effecting the respective high and low sensitivity integrator modes, the integrator input impedance including a differentiator responsive to the speed signal for producing a stabilizing component in the output signal,

whereby the control circuit is conditioned to actuate the limiting means for limiting engine speed to a governed value for all values of engine acceleration.

4,217,868

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY OF THE AUTOMOTIVE TYPE

Günter Grüther, Pinache; Friedrich Rabus, Schwieberdingen, and Ewald Stuible, Eberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,788

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711432

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—416 **17 Claims**

1. An ignition system for an internal combustion engine (E) comprising

an ignition coil (28);

a controlled switch (29) serially connected with the primary of the ignition coil;

a transducer means (10) rotating with the shaft of the engine (E) and providing an ignition control signal (A) and located relative to the shaft of the engine (E) to provide said ignition control signal to occur at an angular position (α_o) of the shaft of the engine in advance of the angular position of the shaft when an ignition event is to occur

a counter (14) controlled by the ignition control signal and

counting, cyclically, under control of said ignition control signal to provide a speed-dependent count number;

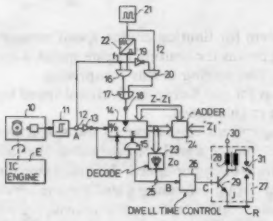
means (21, 22) generating at least two pulse trains of different frequencies to control the counting rate of the counter,

fixed decoding means (23) decoding the final count of the counter, and controlling the controlled switch (29);

counting setting means (24;Zx) acting on the counter (14) independently of the decoding means during a counting cycle thereof and modifying the count number appearing in the counter as a result of counting at the rate of at least one of said frequencies during said ignition control signal;

a dwell time control (26) connected between said decoding means (23) and the controlled switch (29) and determining the closing time of said controlled switch,

the count number (Z_l) introduced to the counter (14) by said count setting means being defined by



$$Z_l = f \cdot t_1$$

wherein Z_l defines said count number; t_1 is the dwell time of said dwell time control; and f is the frequency of the pulse train then being connected to and controlling the counting rate of the counter (14);

wherein the count setting means includes an adder (24) connected to the counter (14) to add, algebraically, said count number ($-Z_l$) to the count state of the counter;

and transfer control means (L) connected to the counter to enter the summed value of the adder state to the then existing count state of the counter under control of said ignition control signal (A).

4,217,869

METHOD OF CONTROLLING THE AIR-FUEL RATIO OF AN AIR-FUEL MIXTURE PROVIDED FOR AN INTERNAL COMBUSTION ENGINE AND A SYSTEM FOR EXECUTING THE METHOD

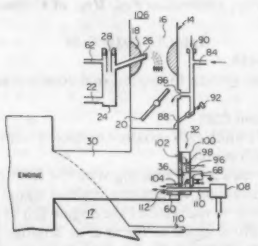
Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 26, 1977, Ser. No. 836,752

Claims priority, application Japan, Sep. 27, 1976, 51/115540

Int. Cl.² F02M *7/00, 31/00*

U.S. Cl. 123—438 **26 Claims**



1. A system in combination with an internal combustion engine for controlling the air-fuel ratio of an air-fuel mixture provided for the engine, the engine including:

an intake passageway providing communication between the atmosphere and the engine, and

an air-fuel mixture producing device for producing an air-fuel mixture for the engine in the intake passageway, said system comprising:

a combustion gas generator defining a reaction chamber having an inlet port communicating with a portion of the intake passageway positioned downstream of a position in which the air-fuel mixture is produced, and an outlet port communicating with the intake passageway downstream of said portion,

first means for admitting a part of the air-fuel mixture produced in the intake passageway into said reaction chamber through said inlet port,

second means for burning the admitted air-fuel mixture in said reaction chamber for producing combustion gases therein,

sensing means for sensing a parameter representative of the concentration of a specific component in said combustion gases which concentration is closely related to the air-fuel ratio of said admitted air-fuel mixture,

third means for controlling the air-fuel ratio of an air-fuel mixture produced by the air-fuel mixture producing device to a desired value by controlling the flow rate of fuel, fed into the intake passageway for production of an air-fuel mixture, in accordance with the sensed parameter, and

fourth means for feeding resultant gases of said combustion gases into the intake passageway downstream of said portion through said outlet port, said system further comprising

a heating plate projecting from said outlet port of the reaction chamber into the intake passageway downstream of said position for heating an air-fuel mixture therein by heat of said combustion gases.

4,217,870

VENTING VALVE FOR CRANKCASES OF RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINES

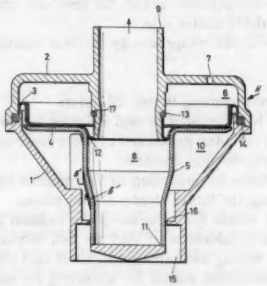
Herbert Schleiermacher, Brühl, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 964,907

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1977, 2753335

Int. Cl.² F02M *25/06;* F01M *13/00*

U.S. Cl. 123—572 **4 Claims**



1. A venting valve for a crankcase of a reciprocable piston internal combustion engine, which includes: a valve housing having a tubular connection fixedly connected thereto for communication with a suction line, a dividing structure comprising an annular movable wall section extending transverse

to said housing and having an outer peripheral portion fixedly and sealingly connected to said housing and having an inner peripheral portion, sealingly engaged and supported by said tubular connection, said dividing structure dividing said housing into an upper and a lower housing section, a hollow cylindrical valve member sealingly connected to said movable wall section and substantially axially aligned with said tubular connection while the interior of said valve member communicates with the interior of said tubular connection, said annular transverse wall section dividing said housing into three chambers, the first one of said chambers being arranged for communication with the outside of said housing, the second one of said chambers surrounding said valve member and having associated therewith a tubular support section for communication with a crankcase to be vented, and a third chamber formed by the interior of said valve member, said valve member being operable to control communication between said second and third chambers, said tubular support section being arranged coaxially of said valve member, said tubular connection and said tubular support section being located opposite each other and said tubular connection also forming support engaging said dividing structure including the movable wall section.

4,217,871

FUEL INJECTION DEVICE FOR COMPRESSION IGNITION ENGINE

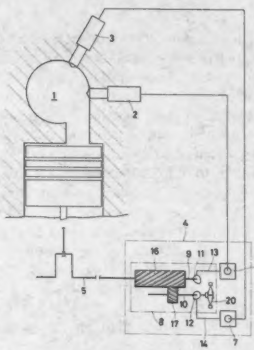
Kanji Ohashi, Tokyo; Kazuo Kontani, Higashi-Kurume; Yoshitada Uchiyama, Abiko, and Kinichi Motohashi, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Aug. 28, 1978, Ser. No. 937,418

Claims priority, application Japan, Aug. 30, 1977, 52-103803

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—501 **3 Claims**



1. A fuel injection device for use with a compression ignition engine having a combustion chamber, a piston in the combustion chamber and a crank shaft rotated by the piston, the fuel injection device comprising the combination of

(a) a plurality of injection nozzles leading into the combustion chamber,

(b) a like plurality of plunger pumps arranged to feed fuel to the plurality of injection nozzles,

(c) a like plurality of rotary shafts disposed parallel to each other,

(1) one of the rotary shafts being arranged to be rotated by the rotating crank shaft of the engine and

(2) the remaining rotary shafts being axially displaceably supported in relation to the one rotary shaft,

(d) a cam mounted on each one of the rotary shafts, each cam being arranged to impart an operating motion to a respective one of the plunger pumps,

(e) a helical gear secured to each one of the rotary shafts, the helical gears of adjacent ones of the rotary shafts meshing with each other, and

(f) adjusting means arranged for axially displacing each one of the remaining rotary shafts relative to the one rotary shaft and thereby to change the meshed position of the helical gears of the remaining rotary shafts in direct proportion to the speed of rotation of the crank shaft of the engine.

4,217,872

MULTIPLE SPARK IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

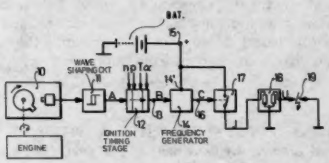
Friedrich Rabus, Schwieberdingen, and Günter Gräther, Pinache, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,738

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619556

Int. Cl.[3] F02P *1/00*

U.S. Cl. 123—596 **8 Claims**



1. Multiple spark ignition system for an internal combustion engine system for combination with

a battery (BAT) supplying electrical energy to the ignition system

said system comprising

an ignition power supply branch connected to the battery (BAT) including

an ignition coil (**18**);

at least one spark gap (**19**) connected to the secondary of the ignition coil;

a controlled switch (**17**) connected to the primary of the ignition coil (**18**) and controlling current flow from the battery thereto,

means (**10, 11, 12**) providing a control pulse (B) to determine initiation of an ignition event;

a frequency generator (**14, 140**) controlled by the control pulse and providing an output pulse train to the controlled switch (**17**) for multiple closing operation of the switch as a function of the width of the pulses of the pulse train, and to cause multiple ignition pulses to be applied to the spark gap,

said frequency generator (**14, 140**) being a pulse width controllable frequency generator providing output signals of varying pulse width and having a control input terminal (**14', 140**) controlling the width of the output pulses provided by said frequency generator;

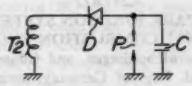
and a spark energy control branch connected to the battery (BAT) including

means deriving a signal representative of battery voltage, said sensed battery voltage signal being connected to the control input terminal (**14' 140'**) of the frequency generator (**14, 140**) to control the width of the output pulses thereof in a sense to increase the width of the output pulses therefrom upon drop of battery voltage so that the energy supplied to the coil (**18**) by the battery, upon closing of said controlled switch (**17**) during occurrence of any one of said pulses, and to cause a single ignition pulse, will be essentially unaffected by drop of battery voltage.

4,217,873
IGNITION CIRCUIT FOR SELF-PURIFYING CREEPING DISCHARGE SPARK PLUGS

Kanemitsu Nishio, Komaki; Takashi Suzuki, Nagoya; Toshihiko Uenaga, Iwata, and Fumio Zega, Hamamatsu, all of Japan, assignors to NGK Spark Plug Co. Ltd. and Yamahara Hatsudoki Kabushiki Kaisha, both of

Filed Jan. 18, 1978, Ser. No. 870,436
Claims priority, application Japan, Jan. 25, 1977, 52-7050
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—653 **5 Claims**

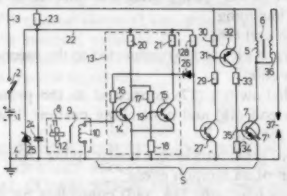


1. An ignition circuit for self-removing carbon deposits from discharge spark plugs, comprising a spark plug including a center electrode and a concentric ground electrode between which is formed a spark gap, said spark gap having a surface along which sparks may move, a capacitor having a capacity between 20 pf and 200 pf located physically adjacent said spark gap and electrically connected in parallel therewith with no intervening components, and an impedance element connected in series with said capacitor and not impeding the movement of electric charge discharged from said capacitor.

4,217,874
IGNITION SYSTEM USING A WIEGAND WIRE

Gerhard Sohner, Remshalden, and Walter Ruf, Korntal-Munchingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,808
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1977, 2731373
Int. Cl.² F02P *1/08*
U.S. Cl. 123—594 **13 Claims**



1. In an internal combustion engine having a rotating member, an ignition system comprising sensor means (8) for furnishing a control signal when said rotating member is at a predetermined angular position relative to a reference position, said sensor means having a Wiegand wire adapted to radiate energy in response to a change of magnetic field in the proximity thereof, rotor means (12) coupled to said rotating member for rotation therewith for creating said change in magnetic field when said rotating member has reached said predetermined position, and sensing coil means (10) coupled to said wire for receiving said energy and furnishing said control signal in response thereto, whereby said control signal is a signal having a very short time duration;

ignition coil means (6) for initiation ignition upon interruption of current therethrough;

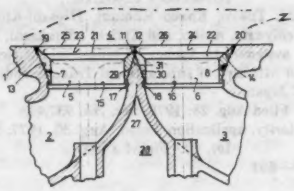
interrupter switch means (7) connected to said ignition coil means for switching from a conductive to a nonconductive state in response to said control signal, thereby interrupting said current through said ignition coil means; and

control circuit means (S) interconnected between said sensor means and said interrupter switch means for maintaining said interrupter switch means in said nonconductive state for at least a predetermined minimum time interval following receipt of said control signal, said control circuit means comprising input switch means (13; 14) having a first and second stable state and adapted to switch from said first to said second stable state in response to said control signal and to remain in said second stable state independently of the absence of said control signal, and further circuit means (15; 39) for switching said input switch means back to said first stable state following said predetermined minimum time interval, said predetermined minimum time interval substantially exceeding said short time duration.

4,217,875
CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY DIESEL ENGINES

Ludwig Elsbett, and Günter Elsbett, both of Industriestr. 14, D8543 Hilpoltstein, Fed. Rep. of Germany

Continuation of Ser. No. 741,351, Nov. 12, 1976, Pat. No. 4,103,663. This application May 16, 1978, Ser. No. 906,428
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550781
The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.
Int. Cl.² F01L *3/00*
U.S. Cl. 123—188 S **1 Claim**



1. A cylinder head for internal combustion engines, especially Diesel engines, which includes wall means defining passage means and a mouth section therefor for communicaton with a combustion chamber, said mouth section comprising an inner portion and an outer portion and a conical surface flaring outwardly from said inner portion to said outer portion, and valve seating ring means having an outer peripheral surface substantially parallel to and adjacent said conical surface, while projecting over the latter, said valve seating ring means being connected to said inner portion only of said mouth section and having its inner peripheral surface provided with a predominantly conically formed valve seating area, the remaining part of said valve seating ring means being slidably expandable along said conical surface of said mouth section during thermal expansion of said valve seating ring means in a direction toward the combustion chamber free of any fastening whatever on the cylinder head.

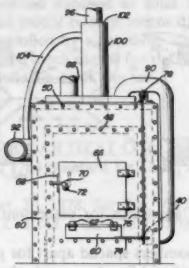
4,217,876
HEATER

James W. Gee, P.O. Box 1476, Cleveland, Tenn. 37311

Filed Jan. 18, 1978, Ser. No. 870,564
Int. Cl.³ F24H *3/00*
U.S. Cl. 126—99 R **3 Claims**

1. A heater including a firebox having an end panel, opposite side panels and top and bottom panels extending between said end and said opposite side panels with one end of said firebox being open, said firebox including depending support legs, an outer housing including opposite side and end walls and a top wall extending between said opposite side and end walls, said outer housing being downwardly telescoped over said firebox with one end wall sealingly secured over the open end of said firebox and said other end wall, top wall and opposite side walls spaced outwardly from said end panel, to panel and opposite side panels, respectively, and with the lower marginal

edges of said opposite side and end walls generally horizontally registered with the lower ends of said legs, grate means in said firebox above said bottom panel, said front wall having a fuel door opening formed therein above said grate means and a draft door opening formed therein below said grate means and above said bottom panel, a flue outlet pipe opening outwardly from said firebox above said grate means and through one of said walls other than said front wall, said outer housing including heating air inlet and outlet means opening thereinto and outwardly therefrom, respectively, said flue outlet pipe opens



upwardly through said top wall, said top wall having an opening formed therethrough upwardly through which said outlet pipe is loosely received, an upstanding tubular manifold having its lower end sealingly secured to said top wall about said top wall opening, the upper end of said tubular manifold including a closure wall upwardly through which said flue outlet pipe extends in sealed relation therewith, and a bypass pipe having an inlet end opening into the upper portion of said manifold and an outlet and opening into said heating air outlet means outwardly of said housing.

4,217,877

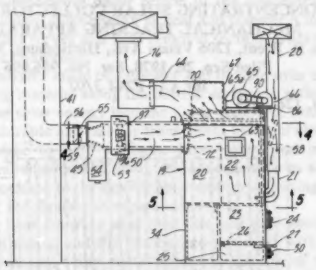
ENERGY-SAVING FORCED-AIR FURNACE

Emanuel J. Uhlyarik, 23309 Westbury Dr., St. Clair Shores, Mich. 48080

Filed Sep. 27, 1978, Ser. No. 946,153

Int. Cl.[2] F24H *3/00*; F28D *17/00*

U.S. Cl. 126—99 R **15 Claims**



1. A furnace including a housing, a refractory supporting plate mounted within said housing and adapted to divide it into an upper heat chamber portion and a lower portion, an opening provided in said refractory supporting plate, a stove chamber mounted in said lower portion and communicating with said opening, a tubing unit having an upper and a lower end mounted in said heat chamber with said lower end sealingly communicating with said stove chamber and said upper end sealingly communicating with the exterior of said housing thereby providing a tubing unit sealed from said heat chamber and communicating with said stove chamber, a plenum forming the top wall of said housing, means to introduce air into said heat chamber, means to exit air from said heat chamber, means to circulate air from said entrance to said exit, and a plurality of serially spaced heat storing solid refractory plates operatively mounted in the space in said heat chamber between said housing and said tubing unit and extending between said refractory supporting plate and said end of said tubing unit wherein said tubing unit includes an upper spacer plate, a plurality of hollow right angle flue tubes of rectangular cross section having upper and lower ends fastened to said upper spacer plates at their upper end, and a lower spacer plate complimentary in shape to said opening in said refractory supporting plate fastened to the lower end of said flue tubes wherein said upper ends of said right angle flue tubes extend outside said furnace housing and are contained in a heat retaining housing attached to said furnace housing.

4,217,878

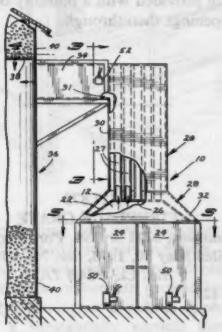
BIOMASS FUELED FURNACE

Gregory J. Wieweck, Box 81, Stewart, Minn. 55385

Filed Mar. 29, 1979, Ser. No. 24,945

Int. Cl.[3] F24H *3/02*

U.S. Cl. 126—110 R **3 Claims**



1. A hot air furnace including:

A. a combustion chamber, said chamber being provided with means to accept a charge of combustible materials initially filling a major portion of it;

B. a chimney open to and extending upwardly from the combustion chamber;

C. a heat exchange jacket adjacent to, encompassing and spaced from a major portion of said chimney, said jacket being provided with an upper opening adjacent an upper portion of said chimney and a lower opening adjacent said combustion chamber;

D. first fan means adjacent one of said jacket openings for moving air into said jacket by way of a first of said openings, through said jacket and out of said jacket by way of a second of said openings;

E. second fan means open to the interior of said combustion chamber and adapted, when operable, to supply a forced draft of combustion air to the interior of said chamber;

F. temperature sensor means situated to monitor the temperature of air discharging from said second jacket opening;

G. control means to render said second fan means operable when said discharging air temperature is below a predetermined temperature range and to render said means inoperable when said air temperature is above said range;

H. said heat exchange jacket being also adjacent to, encompassing and spaced from a major portion of said combustion chamber;

I. said lower opening in said heat exchange jacket being adjacent a lower portion of said combustion chamber;

J. said chimney being constituted as a plurality of spaced apart chimney stacks open through a top wall of said combustion chamber and terminating above said chamber;

K. said first fan means being situated adjacent said lower heat exchange jacket opening;

L. said means to provide access to load fuel into said combustion chamber being constituted as openable door means, which, when closed, constitutes a front wall of the combustion chamber;

M. said second fan means being mounted with respect to a first substantially vertical combustion chamber wall and being open through said first vertical wall to the interior of said combustion chamber;

N. said combustion chamber being provided with a second substantially vertical wall in substantially opposed relationship with respect to said first wall;

O. said heat exchange jacket being provided with an upright wall in adjacent, parallel, spaced-apart relationship with respect to said second combustion chamber vertical wall;

P. said heat exchange jacket vertical wall being provided with said lower opening therethrough; and

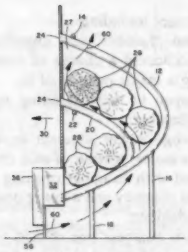
Q. a baffle plate being integrally connected between top edges of said combustion chamber second vertical wall and said heat exchange jacket vertical wall, said baffle plate being provided with a plurality of drying air transmitting openings therethrough.

4,217,879

FIREPLACE GRATE

William T. Comiskey, 2121 3rd St., Port Neches, Tex. 77651

Filed May 30, 1978, Ser. No. 910,614
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—121 4 Claims



1. A fireplace grate comprising:

(a) a first plurality of hollow, parabolic shaped, solid fuel supports having a first focal plane length and being arranged in a rigid side-by-side relationship in a vertical plane,

(b) a second plurality of hollow, parabolic shaped, solid fuel supports having a second and shorter focal plane length and being arranged in side-by-side relationship in a vertical plane and interspersed with said first supports whereby said first and second supports define a chamber for receiving and stacking solid fuel in a generally parabolic configuration, and

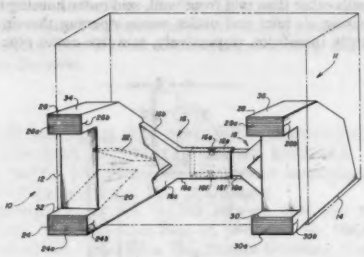
(c) a base support member rigidly maintaining said fuel supports in their side-by-side relationship, and adjusting their height and horizontal position whereby ambient air drawn into said tubes at the bottom thereof will be heated and discharged back into the room being served by said fireplace.

4,217,880

FIREPLACE INSERT

James G. Turner, Jr., 3537 Colgate Ave., Dallas, Tex. 75225

Filed Jul. 18, 1977, Ser. No. 816,433
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—131 10 Claims



3. Air heating apparatus for placement within a fireplace, comprising:

(a) a pair of chambers spaced apart for positioning adjacent to the sides of said fireplace, each chamber being defined by inner and outer side panels joined to top, bottom, front, and rear panels with the front panel of each chamber having an upper air vent and a lower air vent therein;

(b) a first inclined baffle disposed within each of said chambers between the air vents, said first baffle extending from the front panel toward the rear panel but stopping short of the rear panel in each chamber;

(c) a second inclined baffle disposed within each of said chambers between the air vents, said second baffle extending from the rear panel over said first baffle and toward the front panel but stopping short of the front panel in each chamber;

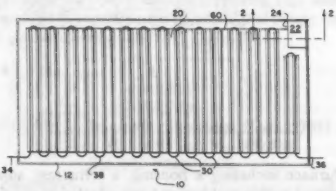
(d) cross duct means joined between the inner panels of the chambers adjacent to the rear panels thereof for connecting in fluid communication said chambers, said cross duct means including V-shaped ends connected to said chambers across the second incline baffles therein.

4,217,881

CONCENTRATING SOLAR COLLECTOR WITH MECHANICAL TRACKING APPARATUS

Charles R. Brent, 1206 Velma Ave., Hattiesburg, Miss. 39401

Filed Sep. 26, 1978, Ser. No. 946,096
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—425 10 Claims



1. A concentrating solar collector with mechanical tracking apparatus comprising a hollow tubing of metal constructed to have an outer cylindrical configuration throughout a substantial given length and for passing a coolant therethrough, a V-shaped trough having energy reflecting surfaces disposed on inside surface walls of the V-shaped trough, the surface walls angularly disposed about 20° from a mid-plane bisecting the V-shaped trough, wherein tab elements are formed at the vertex end of the V-shaped trough and folded over the hollow tubing to provide holding means for supporting said V-shaped

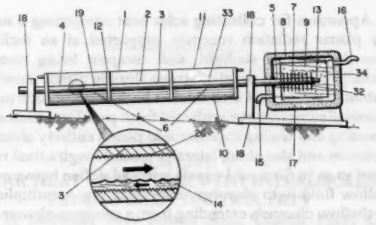
trough upon said cylindrical configuration of said hollow tubing, said V-shaped trough having a cylindrically formed element at its section tangentially joining the two surface walls being used to support the solar collector and said trough arrangement upon a base surface, the upper ends of said V-shaped troughs having a mechanical linkage means affixed thereto and extending therebetween with the approximate midpoint of said linkage means being connected to a driving lever means for moving the V-shaped trough through an angle that follows the east-to-west path of the sun, a protective insulating envelope surrounding the entire solar collector apparatus and the portion exposed to solar radiation being solar transmissive, and motor control means driving the lever means and being controlled by a resetable starting time program operable by digital clock means for the V-shaped trough to repetitively mechanically track the sun.

4,217,882

PASSIVE SOLAR HEAT COLLECTOR

Karl T. Feldman, Jr., 1704 Stanford Dr., NE., Albuquerque, N. Mex. 87106

Filed Oct. 30, 1978, Ser. No. 956,036
Int. Cl.[3] F24J *3/02*; F28D *15/00*
U.S. Cl. 126—433 **17 Claims**



1. An improved passive solar heating apparatus of the type having a solar energy concentrator structured to reflect and focus solar energy into a linear region of small volume so as to increase the temperature in the linear region, having a linear heat absorber of at least one heat pipe, with a first and second end with the first end serving as a heat absorber section located in the high temperature linear region of the concentrator to absorb the focused solar energy as heat and transfer it into the second end that serves as a heat removal section, wherein the improvement comprises:

a. a concentrator made of a durable and flexible solar energy reflecting material along the bottom surface to reflect and focus the solar energy into the linear region of small volume, a durable and flexible transparent material along the top surface to help minimize heat losses, and internal structural ribs located along the concentrator to support and give shape to the flexible solar energy reflecting material and the flexible transparent material;

b. a linear heat absorber of at least one heat pipe having the first end closed and the second end provided with a closure means and being made of material capable of serving as the main axial support structure for the concentrator and capable of serving as a hermetically sealed vessel containing a volatile liquid that transfers heat by evaporation in the heat absorber section and condensation in the heat removal section, said absorber being tilted with the heat removal section above the heat absorber section so that condensed liquid will flow from the heat removal section to the heat absorber section by gravity force and thereby provide heat transfer into the heat removal section but not out of it;

c. a heat sorage reservoir containing a heat absorbing fluid is connected to the heat removal section of the absorber

c. to absorb and store heat, and is provided with inlet and outlet passages for the heated fluid to be drawn off for external use and cool makeup fluid to flow in and is provided with external thermal insulation to minimize heat loss to the surroundings; and

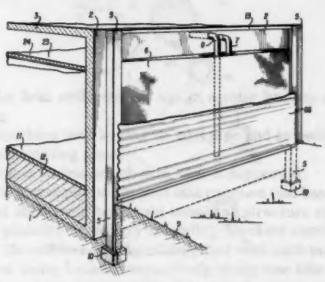
d. a support structure attached to the absorber and to the heat storage reservoir adapted to support the apparatus on whatever base it may be placed in a proper orientation to receive the solar energy and to allow the apparatus to be rotated about the linear focal axis so that the concentrator can focus the solar energy onto the absorber.

4,217,883

METAL SCREEN SOLAR HEAT COLLECTOR WALL

Edward J. O'Hanlon, Assembly Point, Lake George, N.Y. 12845

Filed Jan. 18, 1978, Ser. No. 870,481
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—434 **10 Claims**



1. A solar heat collecting wall assembly comprising:

a pair of spaced, post-like support members, each support member having a lower end portion adaptable for being fixedly supported on or beneath ground level with each support member having an attached, upper end portion extending in a substantially vertical direction above ground level, said support members each having a first side portion facing in a first direction substantially parallel to one another and said support members each having a second, oppositely disposed side portion facing in a second opposite direction substantially parallel to one another;

first and second enclosure members each extending in a substantially parallel horizontal direction relative to one another between said pair of support members, with said first enclosure member positioned substantially vertically above said second enclosure member;

a heavily insulated foam wall fixedly engaging the first side portion of each of said spaced support members and at least one sheet of heat transmitting material fixedly engaging the second side portion of each of said spaced support members, said pair of spaced support members, said first and second enclosure members, said heavily insulated foam wall and said sheet of heat transmitting material defining a solar heat collecting space therebetween;

a pair of spaced, black metal screen members positioned within said solar heat collecting space, each of said screen members extending in a substantially vertical direction and having a first pair of opposite end portions attached to one of said first and second enclosure members, respectively, and a second pair of opposite end portions attached to one of said support members, respectively;

inlet conduit means extending through an aperture in said heavily insulated foam wall located substantially adjacent to said first enclosure member and having an opening located substantially adjacent said second enclosure member and between said pair of screen members for selectively introducing a continuous flow of gaseous fluid at a first temperature into a vertically lower most portion of

said solar heat collecting space, creating a natural flow of said gaseous fluid in a vertically upward direction through said solar heat collecting space; and

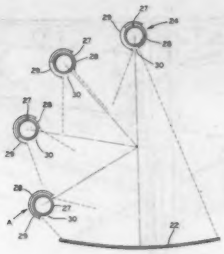
outlet means extending through a further aperture in said heavily insulated foam wall and having an opening located substantially adjacent said first enclosure member and between said pair of screen members for removing said continuous flow of gaseous fluid at a second, higher temperature from a vertically uppermost portion said solar heat collecting space.

4,217,884

COLLECTION AND UTILIZATION OF SOLAR ENERGY

John D. Strong, 136 Gray St., Amherst, Mass. 01002

Filed Apr. 27, 1978, Ser. No. 900,344
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—438 7 Claims



1. In a method of utilizing solar energy in which the sun's rays are received on an elongated reflecting surface located transversely of the path of daily movement of the sun across the sky, and said rays are reflected from said surface to direct rays through a variable aperture in a housing surrounding a conduit type absorber that is substantially parallel with said reflecting surface and to concentrate said rays as a linear image along said absorber; the improvement which comprises maintaining and continuing said directing and concentrating actions during selected daylight hours by swinging said housing and absorber from a starting position at one side of said reflecting surface toward the other side thereof through said selected hours to track the movement of said linear image during said hours, and adjusting said aperture to accommodate the changing insolation angles and linear image width resulting from said movement of the sun during said selected daylight hours.

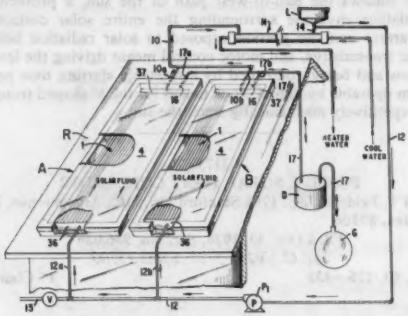
6. In an apparatus for utilizing solar energy; a plurality of absorber assemblies each comprising a black absorber tube for receiving and absorbing heat from rays of the sun, and baffle means comprising a pair of slotted, overlapping coaxially mounted cylinders mounted concentrically of said tube for bodily movement therewith and for rotary movement about the axis of the tube to form a variable width aperture through which said rays reach said tube; means for moving said cylinders relative to one another and to said absorber tube to control the size and position of said aperture; an arcuately shaped elongated booster mirror having a focal plane and focal line, said focal line lying substantially parallel with the absorber tube of each of said assemblies, said mirror collecting rays of the sun reflecting and concentrating them toward and through said aperture and concentrating linear images thereof on said tube; means mounting said plurality of absorber assemblies for swinging movement in arcuate paths in a plane substantially perpendicular to the focal line of the reflector; means for swinging said assemblies in one direction within said arcuate paths in timed relation to the movement of the sun; a glazed and insulated box within which said swingable absorber assemblies and said mirrors are mounted in angular relation to the daily movement of the sun across the sky; and means for flowing a fluid through said black absorber tubes.

4,217,885

SOLAR HEAT COLLECTION

Vernon O. Bowles, Naples, Fla., assignor to Solartrap, Inc., Naples, Fla.

Continuation-in-part of Ser. No. 676,156, Apr. 12, 1976. This application Apr. 18, 1978, Ser. No. 897,402
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—444 11 Claims



1. Apparatus for collecting solar heat comprising a substantially planar radiation receptor supported at an inclination across the path of sunlight, said receptor being composed essentially of a front panel of strong flexible plastic sheet material about 0.004 to 0.04 inch thick, a back panel of such material substantially coextensive with said front panel and means interconnecting and sealing together said panels entirely about their peripheries and also along laterally spaced longitudinal regions thereof so as to form said panels into and define between them a shallow fluid-tight chamber subdivided into a multiplicity of long shallow channels extending from a common plenum space in the lower end of the chamber to a common plenum space in its upper end, an inlet to said lower plenum space for liquid flow into said chamber, an outlet from said upper plenum space for outflow of heated liquid, said channels each being of not more than $\frac{1}{4}$ inch in average depth and being sufficiently limited in width that liquid filling and being heated in said chamber will not distort said channels and will flow only upwardly in them under the influence of thermal-specific gravity gradients to bring hotter liquid preferentially into said upper plenum space, conduit means for conducting liquid in a circuit from said outlet to a heat exchange zone and thence back into said inlet, means for keeping said chamber and said conduit means completely filled with liquid and holding the liquid in said chamber constantly under a substantially uniform limited pressure insufficient to rupture said receptor, and means for continuously circulating the liquid in said circuit into and upwardly through and from said chamber under a constantly low pumping pressure.

4,217,886

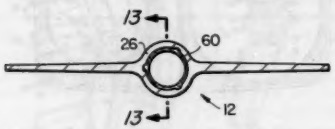
RADIANT ENERGY COLLECTING OR EMITTING ELEMENT AND METHOD AND TOOL FOR MANUFACTURE THEREOF

Jay C. McLaughlin, Santa Rosa, Calif., assignor to General Thermal Corporation, Santa Rosa, Calif.

Filed Dec. 5, 1977, Ser. No. 857,133
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—446 6 Claims

1. A solar energy heat exchange element comprising the combination of a metal elongate outer member having a central bore of uniform radius, means forming a solar energy heat exchange surface extending lengthwise of and projecting radially outwardly from the outer member, a plurality of circumferentially spaced grooves formed in helical paths along the central bore, said bore having smooth surface portions extend-

ing along the spacing between adjacent grooves, a metal elongate cylindrical inner member having an outer surface and formed of a different metal than said outer member mounted within the central bore, a plurality of circumferentially spaced helical lands on the outer surface of said inner member, said lands projecting radially outwardly into interfitting engagement with the grooves for locking the inner and outer mem-



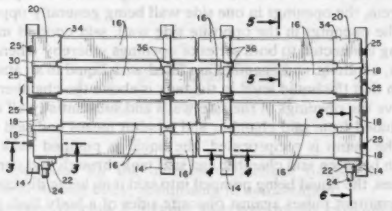
bers against relative longitudinal and rotational displacement, said inner member having smooth surface portions between the lands in intimate surface contact with the surface portions of the outer member for maintaining said intimate surface contact under changing thermal and mechanical stresses, and passageway means formed along the length of the inner member for conducting a fluid heat exchange medium.

4,217,887

SOLAR HEAT COLLECTOR WITH INTERLOCKING EXPANDABLE CONSTRUCTION

Louie E. Hoffman, 7446 Asman Ave., Canoga Park, Calif. 91307, and Douglas M. Warne, 20317 Coulson St., Woodland Hills, Calif. 91367

Filed Jul. 8, 1977, Ser. No. 813,919
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—448 **6 Claims**



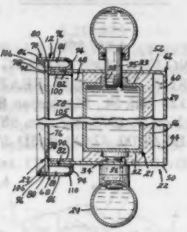
1. In a system for collecting solar heat energy in which a heat-absorbing fluid is circulated, an assembly comprising:
- a plurality of heat-absorbing substantially flat conduits having an oval cross-sectional shape;
- a plurality of interlocking tee means having a tubular cross-sectional shape interlocking adjacent ends of said flat conduits into a lattice work assembly;
- said interlocking tee means having a male flange on a first end and a female flange on a second end for connecting adjacent interlocking tee means and a female flange between the ends fitting over said flat conduits whereby said interlocking tee means form input and output manifolds;
- said female flange intersecting said tubular interlocking tee means substantially tangent to the circumference; and
- adapter means for connecting said manifolds to circulating means for circulating a heat-absorbing fluid.

4,217,888

LIQUID SOLAR HEAT COLLECTOR

John F. Finger, Beresford, S. Dak., assignor to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Dec. 14, 1977, Ser. No. 860,590
Int. Cl.[3] F24J 3/02; E06B 7/14
U.S. Cl. 126—450 **5 Claims**



5. A solar heat collector for use in a solar heating system, comprising:
- a heat absorbing tank having an inlet pipe and an outlet pipe;
- a heat transmitting panel;
- a base frame within which said tank is supported;
- a mounting structure to support said panel on said base frame spaced above said tank, said mounting structure comprising a plurality of unitary mounting brackets corresponding to the number of sides of the panel with each mounting bracket being located respectively along one side of said panel, each of said mounting brackets having a generally S-shaped cross-section which defines an outside loop and an inside loop, said outside loop having an outer leg engaging against an adjacent edge of one side of said panel and extending up above said panel so as to define an exteriorly exposed interface, said inside loop being sized to frictionally engage a portion of said base frame, said inside loop further having a portion which abuts against a face of said panel to support said panel thereon; and wherein a generally U-shaped conduit is formed by said outside loop located beneath the adjacent edges of said panel for trapping and conveying away liquid leaking past said exposed interface, and wherein said mounting brackets are interconnected at their ends, and said conduit includes at least one drain hole through which said leaked liquid may drain.

4,217,889

FLAP DEVELOPMENT DEVICE AND METHOD OF PROGRESSIVELY INCREASING SKIN AREA

Chedomir Radovan, Woodland Hills, and Rudolf R. Schulte, Goleta, both of Calif., assignors to Heyer-Schulte Corporation, Goleta, Calif., a part interest

Continuation of Ser. No. 723,338, Sep. 15, 1976, abandoned. This application Jul. 20, 1978, Ser. No. 926,484
Int. Cl.[2] A61B 19/00
U.S. Cl. 128—1 R **31 Claims**

23. A device to progressively increase skin area over a prolonged period of time after surgical implantation, comprising: a highly expandable skin stretching chamber joined in flow communication with a substantially less expandable puncture chamber; said skin stretching chamber having a shape retaining base that is substantially stiffer than a flexible cover of the skin

stretching chamber for controlling the shape of such skin stretching chamber during progressive enlargement; and the skin stretching chamber is collapsible to a volume substantially less than one half of its inflatable volume for insertion under a section of skin, whereby the skin stretching chamber can be progressively enlarged by periodic hypodermic injections through the skin into the puncture chamber.

4,217,890

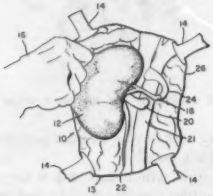
SURGICAL SLING FOR POSITIONING A HARVESTED KIDNEY DURING SURGICAL REATTACHMENT

Milton L. Owens, 128 20th St., Manhattan Beach, Calif. 90266

Filed Nov. 3, 1978, Ser. No. 957,569

Int. Cl.³ A61B *19/00, 17/00;* **B65D** *30/00, 33/00*

U.S. Cl. 128—1 R **6 Claims**



1. A kidney sling for positioning a harvested kidney during surgical reattachment of said harvested kidney to a blood supply which comprises:

a. a matching pair of continuous sling sides, each of said sling sides being formed of a substantially flat, thermally insulative and water-impermeable material substantially shaped at its periphery to conform closely to the shape of a kidney;

b. said sides being joined together at their periphery to thereby form a sling having an interior cavity which closely conforms to the shape of a kidney; and

c. an aperture formed in the lower portion of said sling to allow the protrusion of the artery, vein and ureter associated with said harvested kidney whereby said sling provides a thermally insulative environment for said kidney during such surgical reattachment process so that the effects of warm ischemia are minimized.

5. In the transplantation of a kidney from a donor to a donee wherein it is required that the donor's supply of blood be removed from said kidney prior to the surgical attachment of said kidney to the blood supply of said donee, the improvement comprising the step of enclosing said harvested kidney in a sling fabricated of an impermeable, thermally insulative material, whereby the thermal insulation provides protection for said kidney during surgical attachment to the blood supply of said donee and warm ischemia during anastomosis is thereby minimized.

4,217,891

NOVEL ARTHROSCOPE

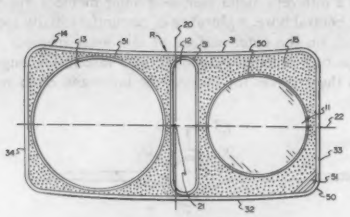
Robert W. Carson, 1419 Circle Way, Salt Lake City, Utah 84103

Continuation-in-part of Ser. No. 806,833, Jun. 15, 1977. This application Dec. 19, 1977, Ser. No. 861,632

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **20 Claims**

1. In an arthroscope with structural elements including an optical system and a lighting system fixed within a rigid sheath, the improvement which comprises providing said sheath with a cross-sectional configuration, as viewed from its distal end, having major and minor axes intersecting at the geometric center of said cross-section, wherein the dimension of the cross-section of the interior of the sheath along the said minor axis is just sufficient to accommodate the largest of said elements, one of said opposing sides is concave and the other opposing side is convex.



4,217,892

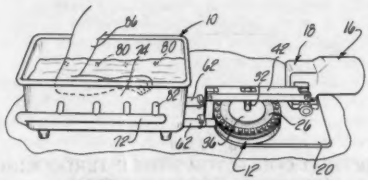
HYDRO-THERAPY DEVICE

Joseph H. Brill, 5210 E. Deckerville Rd., Deckerville, Mich. 48427

Filed Aug. 6, 1979, Ser. No. 64,077

Int. Cl.² A61H *9/00*

U.S. Cl. 128—66 **12 Claims**



1. A hydro-therapy device comprising a massage tank open at its upper end and having a bottom wall and a pair of opposite side walls, a pump having a pumping chamber defined by a reciprocating wall, means for reciprocating said last-mentioned wall to enlarge and diminish the volume of said chamber, conduit means extending from said chamber to said tank, the upper end of said tank being disposed at a level above said chamber, each of said side walls having a series of openings therein, the openings in one side wall being generally opposed to the openings in the opposite side wall, said conduit means being connected to both series of openings whereby when said tank, conduits, and chamber are filled with liquid in an amount such that the liquid level in the tank is above the chamber and above the openings in the side walls and substantially all air is excluded from said chamber and conduit means and said wall of the pump is reciprocated, the liquid is pumped back and forth between said chamber and said tank through said conduit means, the liquid being pumped into said tank being directed as intermittent pulses against opposite sides of a body limb positioned between said side walls and aligned with said openings.

4,217,893

ABOVE-THE-KNEE CAST

Hugh W. Payton, 416 Jupiter St., Washington Court House, Ohio 43160

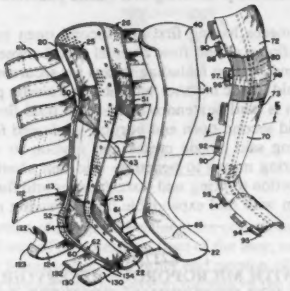
Continuation of Ser. No. 820,558, Aug. 1, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,682

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—89 R **13 Claims**

1. A non-weight bearing above-the-knee cast comprising a posterior shell of rigid non-bendable material having a contoured shape to receive approximately the posterior third of the leg and foot, said shell extending from the mid-thigh distally to the knee, the lower leg, the ankle and the foot beyond the toes, said shell having a shape to support the leg in a position of physiological rest at an angle of approximately 15° to

20° to the thigh and with the foot at an angle of approximately 90° to the long axis of the lower leg, said shell having pliable fabric sides extending from the thigh distally to beyond the toes, elastic elements in said sides overlying the areas of the



knee and the ankles to accommodate swelling in said areas, and means for confining the pliable sides of the elastic elements to retain the entire leg in immobilized position relative to said cast.

4,217,894

APPARATUS FOR SUPPLYING MEDICATION TO THE HUMAN OR ANIMAL BODY

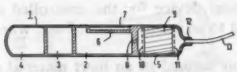
Manfred Franetzki, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

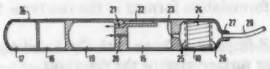
Filed May 4, 1978, Ser. No. 902,810

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721752

Int. Cl.[2] A61J *7/00;* **A61M** *7/00, 31/00*

U.S. Cl. 128—213 R **20 Claims**





1. Apparatus for the infusion of medical fluids into the human or animal body, comprising in combination:

a storage receptacle having reservoir means providing a reservoir (**5, 18**) with a fluid inlet (**8, 23**) providing a fluid passage leading to said reservoir (**5, 18**) and with a discharge port (**12, 27**) providing a fluid passage leading from said reservoir (**5, 15**),

a solid medication (**9, 24**) disposed in said reservoir (**5, 18**) such that the fluid inlet (**8, 23**) provides a fluid passage in fluid communication with said solid medication,

a conveyance and dosing unit in fluid communication with said fluid inlet (**8, 23**) comprising supplying means for the supply of a solvent to said solid medication (**9, 24**) via the fluid passage provided by said fluid inlet such that the solvent progressively dissolves the solid medication to form a medical fluid in the vicinity of said solid medication in said reservoir,

said storage receptacle being constructed to accommodate supply of said medical fluid so formed in said reservoir (**5, 15**), to said discharge port (**12, 27**), while retaining in said reservoir undissolved portions of said solid medication, and

said conveyance and dosing unit being operable to control the dose of said medical fluid supplied to said discharge port by controlling the transport of solvent to said reservoir whereby in the storage receptacle the amount of solid medication dissolved per dose of medical fluid corresponds to a desired dosing schedule.

4,217,895

INTRAVASCULAR CATHETER

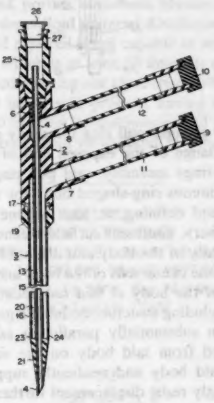
Kyuta Sagae, Tokyo; Susumu Tanabe, Sagamihara, and Hiroshi Kamogawa, Fujinomiya, all of Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed May 26, 1978, Ser. No. 909,721

Claims priority, application Japan, Jun. 3, 1977, 52-72314[U]

Int. Cl.[2] A61M *5/00, 25/00*

U.S. Cl. 128—214.4 **3 Claims**



1. An intravascular catheter, comprising:

a hub having an axial passage which is open at the forward end and sealed with a sealing member at the base and opposite to said forward end, a first laterally extending auxiliary passageway branched from the axial passageway near the forward end of the hub, and a second laterally extending auxiliary passageway communicating with the axial passageway at the sealed end of the axial passage;

a flexible double-walled tube having a solid and smoothly and uniformly tapered tip portion of one-piece construction and of the same material as that of the tube portion and consisting of an inner tube extending into the axial passageway formed in the hub and providing a central passageway and an outer tube disposed in coaxial relation to the inner tube and with its outer surface merging smoothly with the tapered surface of said tip portion, thereby forming an annular passageway between the outer wall of the inner tube and the inner wall of the outer tube, the base edge of the inner tube being secured at an intermediate portion between the positions from which the first and second laterally extending auxiliary passageways extend outward so as to enable the central passageway formed in the inner tube to communicate with the second auxiliary passageway, the base edge of the outer tube being fixed to the forward end of the hub so as to enable the annular passageway to communicate with the first auxiliary passageway, and the central passageway having an opening at the distal end of said tip portion and the forward end of the annular passageway having at least one bore provided at the forward end portion of the outer tube substantially flush with the juncture of the outer tube and said tip portion; and

a needle removably inserted into the central passageway formed in the inner tube through the sealing member provided at the base portion of the hub such that the tip of the needle extends beyond the tapered tip of the double-walled tube and defines a smooth continuation of the tapered outer surface of said tip portion.

4,217,896

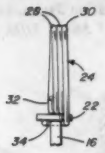
SYRINGE PLUNGER SNAP-ON PULL RING

Robert C. Behnke, Oshkosh, Wis.

Filed Dec. 19, 1978, Ser. No. 970,858

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—218 PA **7 Claims**



1. A syringe plunger pull ring for ready attachment to the enlarged end flange of the exposed end of the plunger of a hypodermic syringe assembly, said pull ring including a peripherally continuous ring-shaped body for receiving a finger therethrough and defining, at least at one location thereof about its periphery, abutment surface means facing generally radially outwardly of the body and disposed in a plane generally paralleling the center axis of the body and tangential to the outer surface of the body at said one location thereon, said body further including structure defining a generally U-shaped retainer portion substantially paralleling said plane, spaced slightly outward from said body on the side of said plane remote from said body and resiliently supported from said body to yieldingly resist displacement further away from said abutment surface means, said U-shaped retainer portion opening in a direction substantially paralleling a plane containing said body, the spacing between said retainer portion and said abutment surface means being slightly less than the thickness, measured in the direction of the longitudinal extent of the plunger, of end flange, and said U-shaped retainer portion being adapted to seatingly receive said plunger, inwardly of said end flange, therein.

4,217,897

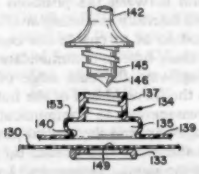
EXPANDABLE SYRINGE AND MEANS FOR STORING CHEMICAL AGENTS FOR USE THEREWITH

Vincent R. Sneider, 3422 Hallcrest Dr. NE., Atlanta, Ga. 30319

Continuation-in-part of Ser. No. 744,046, Nov. 22, 1976, Pat. No. 4,133,313, which is a continuation-in-part of Ser. No. 591,612, Jun. 30, 1975, Pat. No. 3,993,070. This application Oct. 23, 1978, Ser. No. 953,728

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—232 **4 Claims**



1. A syringe comprising:

fluid receiving means including an elastic member having at least an elastic puncturable portion;

nozzle means including an elongated body member having an end portion adapted for fluid communication with said expandable fluid receiving means, said end portion including means for puncturing said elastic puncturable portion; and

coupler means having first and second open end portions and defining a fluid flow channel therebetween, said first open end portion including means for secure engagement with said elastic member whereby said elastic puncturable portion is tautly extended across said fluid flow channel, and said second open end portion is adapted for securely receiving said nozzle means end portion to enable said puncturing means to penetrate said taut elastic puncturable portion to bring said nozzle means into fluid communication with said expandable fluid receiving means.

4,217,898

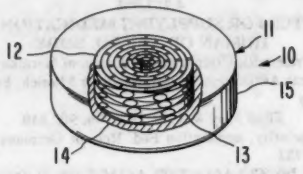
SYSTEM WITH MICROPOROUS RESERVOIR HAVING SURFACE FOR DIFFUSIONAL DELIVERY OF AGENT

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Oct. 23, 1978, Ser. No. 953,907

Int. Cl.[3] A61M *31/00*

U.S. Cl. 128—260 **16 Claims**



1. A diffusional device for the controlled dispensing of a beneficial agent to an environment of use, wherein the device comprises:

(a) a reservoir formed of an inert material consisting of a multiplicity of micropores and micropaths, said reservoir having,

(b) an exposed surface area for admitting an external fluid present in the environment of use and for dispensing an agent formulation formed in the reservoir to the environment,

(c) a wall impermeable to both fluid and agent on the remaining surface area of the reservoir,

(d) a beneficial agent housed in both the micropores and micropaths; and,

(e) wherein, in operation when the device is in the environment of use, fluid in the environment enters the device through the exposed surface into the reservoir forming an agent formulation that is dispensed by diffusion from the exposed surface of device to the environment at a controlled rate over a prolonged period of time.

4,217,899

COLONIC ENDOPROSTHESIS

Lutz Freier, Hausserstr. 140, 7400 Tübingen 1, Fed. Rep. of Germany

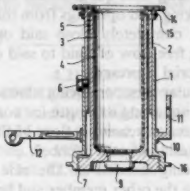
Filed Nov. 2, 1977, Ser. No. 847,820

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—283 **17 Claims**

1. A colonic endoprosthesis comprising an elongated tubular jacket element adapted to be planted in the body of the user and having one end portion and another end portion spaced from said one end portion; a container element removably insertable into said jacket element so as to be located in the

body of the user, said container element including a hollow support member and an elastic lining member mounted on and received in said hollow support member; means for retaining said container element in a fully inserted position thereof relative to said jacket element; a first connecting formation on said



one end portion of said jacket element for connecting the latter to the distal end of the intestenal tract of the user; and a second connecting formation on said other end portion of said jacket element for connecting the same to the skin of the user so that feces or partially digested food are removed from the body through the colonic endoprosthesis.

4,217,900

MENSTRUATION TAMPON

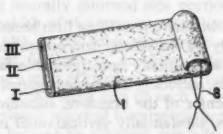
Georg Wiegner, Viersen; Hartmut Schwolow, Grefrath; Dieter Klein, Erkelenz, and Jürgen Malaskiewicz, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,220

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1977, 2744466

Int. Cl.[2] A61F *13/20*

U.S. Cl. 128—285 **4 Claims**



1. A menstruation tampon of wadding from fibers selected from the group consisting of cotton fibers, rayon staple fibers and mixtures thereof, said wadding having been treated to give increased absorbing by addition of from 0.5% to 3% by weight of a hydrophilic agent evenly dispersed on said wadding and rolled into a tampon, said wadding further containing from 2% to 5% by weight of a hydrophilic agent deposited on a longitudinal section which is from 10% to 35% of the total length of the formed tampon, which forms a zone of increased absorbency.

4,217,901

CRUSH-RESISTANT ADHESIVELY-ATTACHED ABSORBENT PRODUCT

James A. Bradstreet, Colts Neck, and Judith E. Roller, North Brunswick, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Oct. 6, 1978, Ser. No. 949,333

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—290 R **7 Claims**

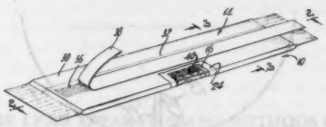
1. A thin catamenial absorbent product for adhesive attachment to a wearer's garment comprising:

a planar, generally rectangular, absorbent pad having a body-facing major surface and a garment-facing major surface;

an outer cover overlying at least the garment-facing major surface;

a pressure-sensitive adhesive element disposed on said outer cover for adhering said product to a wearer's garment; and

means for providing said pad with planar crush resistance, said means comprising providing on said garment-facing



major surface of the pad and integral therewith, a densified, compacted, porous, absorbent, fibrous layer having a particulate hydrocolloid material distributed therein;

said hydrocolloid material being capable of absorbing water in an amount which is at least 10 times its own weight in dry form and comprising not more than 50% by weight of said densified layer; said product having a thickness of from about 3.0 to about 7.0 millimeters and having a crush resistance of from about 1.0 to about 3.0 pounds per square inch.

4,217,902

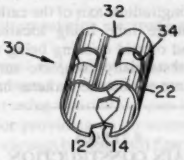
HEMOSTATIC CLIP

Alfred L. March, 889 NE. 125 St., North Miami, Fla. 22161

Continuation of Ser. No. 793,047, May 2, 1977, abandoned. This application Nov. 14, 1978, Ser. No. 966,293

Int. Cl.[3] A61B *17/08*

U.S. Cl. 128—325 **5 Claims**

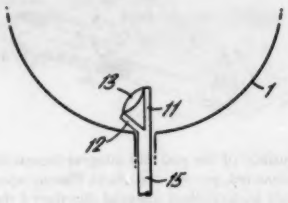


1. A hemostatic clip for applying a predetermined pressure to opposite wound flaps comprising a sheet of resilient material in the form of an elongated tubular body **(10, 30, 31)**, wound flap engaging means **(12, 14)** on said tubular body, said wound flap engaging means being the edges **(12)** of an elongated slit extending longitudinally of said tubular body and longitudinally spaced apart teeth **(14)** on both slit edges extending toward each other in normal contacting relation, a portion of the periphery of said tubular body being bent radially inwardly, at a location diametrically opposite said slit, to form an upwardly open channel substantially U-shaped in cross-section and extending the entire length of the tubular body and providing an integrally formed resilient hinge section, the portions of the periphery of said tubular body on opposite sides of said channel being provided with means for receiving the jaws of a plier, whereby force may be applied to said body on opposite sides of said resilient hinge section and against the bias thereof to separate said teeth and hold them separated while applying said teeth to opposite wound flaps, and when the pressure is released, said teeth and slit edges will be resiliently biased to move the wound flaps toward contact with each other and then hold the wound flaps in predetermined pressure contact until such time as pressure is again applied to said tubular body to separate said slit edges and teeth from contact with the wound flaps to thus release the wound flaps.

4,217,903
DRAINAGE DEVICES

Ross O. Witherow, 17 De Beauvoir Sq., Islington, London N.1., England

Filed Nov. 30, 1978, Ser. No. 965,204
Claims priority, application United Kingdom, Dec. 29, 1977, 54185/77
Int. Cl.[3] A61M 25/00
U.S. Cl. 128—349 B 4 Claims

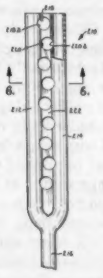


1. A catheter adapted for insertion into a body cavity, said catheter having an insertion end and a drainage tube and being further provided with an inflatable balloon adjacent said insertion end and a balloon filling channel; said insertion end comprising two branches having free ends which are inter-connected by the inflatable balloon, one of said branches terminating at the end of said insertion end of the catheter and the other said branch terminating short of said end; said branches being arranged, in the uninflated state of the balloon, to extend substantially parallel to the longitudinal axis of the catheter and to constitute substantially no increase in the width or diameter of the catheter; said one branch comprising an extension of the drainage tube of the catheter and the balloon filling channel being located in one of said branches and being in communication with the interior of the balloon, said balloon being arranged to be inflated by passing fluid through said filling channel and, in the inflated state of the balloon, said other branch diverging from the longitudinal axis of the catheter, an opening leading to the drainage tube being located between said branches and one end of said opening being spaced from the balloon to permit substantially complete emptying of fluids from a body cavity into which the catheter has been inserted.

4,217,904
DRAIN CONSTRUCTION

Carroll L. Zahorsky, 4706 Broadway, Kansas City, Mo. 64112

Continuation-in-part of Ser. No. 781,167, Mar. 25, 1977, Pat. No. 4,139,012. This application Dec. 14, 1978, Ser. No. 969,488
The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.
Int. Cl.[2] A61M 27/00
U.S. Cl. 128—350 R 7 Claims



1. A device for the passage of fluid between a congested area characterized by the presence of material capable of blocking the passage and an area removed from the congested area, said device comprising:

first and second tubular members each having a plurality of openings disposed along the length of the member; and

means for holding said members in spaced apart lateral relationship along their longitudinal axes and for at least partially blocking said openings from the entry of material which would completely close said openings while accommodating free flow of fluid to said openings when no blocking material is present,

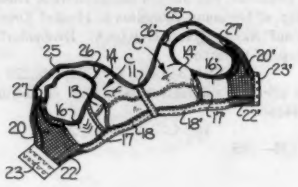
each of said tubular members being characterized by a plurality of openings along its length for communication with one of said areas to receive a flow of fluid from said one area to the interior of said member,

said openings being located on the side of said member which is facing the other member and between two parallel imaginary planes extending through opposed points on the surface of the member.

4,217,905
ATHLETIC BRASSIERE

Mark V. Atwater, and W. David Atwater, both of Yanceyville, N.C., assignors to Royal Textile Mills, Inc., Yanceyville, N.C.

Filed Mar. 2, 1979, Ser. No. 17,149
Int. Cl.[2] A41C 3/00
U.S. Cl. 128—498 8 Claims



1. An athletic brassiere providing firm breast support during vigorous activity by the wearer and comprising

(a) a pair of substantially nonstretchable fabric breast supporting cups, including inner edges joined to each other at the front center of the brassiere, substantially horizontal lower edges, substantially vertical outer edges, and shoulder strap portions extending divergently upwardly to provide a substantially V-shaped neckline therebetween,

(b) a pair of substantially nonstretchable fabric side panels including substantially vertical inner and outer side edges, substantially horizontal lower edges aligned with said lower edges of said breast supporting cups, and downwardly curved upper edges, said inner vertical edges of said side panels each being fixed to corresponding outer side edges of said breast cups,

(c) a substantially nonstretchable support band extending beneath said breast cups and said side panels and including opposed ends, a free lower edge, and an upper edge fixed to said aligned lower edges of said breast cups and said side panels,

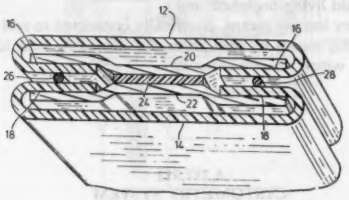
(d) a pair of two-way stretchable elastic back panels including substantially vertical inner and outer side edges, horizontal lower edges aligned with said free lower edge of said nonstretchable support band, and shoulder strap portions extending divergently upwardly from the upper portions of said back panels,

(e) closure tabs fixed to the outer vertical edges of said elastic rear panels and being adapted to be adjustably connected together to close the brassiere in the middle of the back of the wearer, and

(f) a pair of nonstretchable fabric shoulder straps including forward ends fixed to said shoulder strap portions of said breast cups and rearward ends fixed to the upper ends of

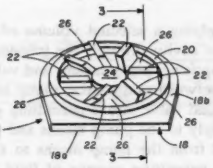
said shoulder strap portions of said elastic back panels, said elastic back panels providing the sole stretchable segments of said brassiere to freely accommodate expansion of the chest and permit comfortable breathing of the wearer and movement of the upper body parts while providing firm support and limiting vertical and lateral movement of the breasts of the wearer during vigorous activities.

4,217,906
SHOULDER STRAPS
Reginald F. Perron, Chambly, Canada, assignor to Hubscher Ribbon Corporation Ltd., Montreal, Canada
Filed Sep. 7, 1978, Ser. No. 940,402
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—510 **9 Claims**



1. A shoulder strap comprising upper and lower outer portions extending from one side edge of the strap to the other, the upper and lower portions having laterally inturned side portions at at least one side edge of the strap, a double layer of filler strip located between the upper and lower outer portions, the upper filler strip layer having a side edge portion located between the upper outer portion and an adjacent laterally inturned side portion thereof, and the lower filler strip layer having a side edge portion located between the lower outer portion and an adjacent laterally inturned side portion thereof, each said adjacent laterally inturned side portion being short compared to the width of the strip so as to leave substantial portions of the width of the filler strip layers adjacent each other, said adjacent portions of the filler strip layers being bonded together by a strip of synthetic plastic material extending longitudinally of the strap and of such a width that said strip of synthetic plastic material terminates short of each side edge of the strap formed by adjacent laterally inturned side portions, and each pair of adjacent laterally inturned side portions being bonded together by a separate length of synthetic plastic material extending longitudinally of the strap.

4,217,907
ORTHOPEDIC SHOE CONSTRUCTION
Theodore J. Meiller, 1308 Bennett, Bryan, Tex. 77801
Filed Aug. 14, 1978, Ser. No. 933,592
Int. Cl.[2] A43B *7/24*
U.S. Cl. 128—583 **6 Claims**

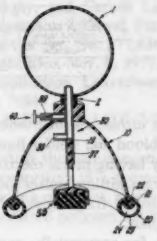


1. An orthopedic appliance having a two sided base, with one side adapted for securing to the bottom of a shoe, comprising in combination:

an arrangement of a plurality of projecting ribs extending from the second side of said base to establish a moment in said base and an attached shoe to cause rotation thereof in response to ground engagement of said projections under an applied weight, and

stabilizing means surrounding the projecting ribs to limit the compression thereof between the second side of the base and ground engagement and to provide a fixed supporting surface.

4,217,908
VECTOR LEAD APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME
Peter J. Staver, Lincoln Park, Mich., assignor to Bernard B. Staver and Margaret Staver, both of Baraboo, Wis., part interest to each
Filed Oct. 16, 1978, Ser. No. 951,610
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—643 **14 Claims**



1. A medical instrumentation electrode apparatus, comprising:

a substantially rigid and hollow vacuum bell, said vacuum bell being fabricated of electrically-insulating material;

first means for creating a partial vacuum in said vacuum bell;

second means for providing an air communication passage between said vacuum bell and said first means, said second means being selectively interconnectible between said vacuum bell and said first means;

a contact member including a rod member having a cup member affixed to a lower end thereof, said rod member and said cup member being fabricated of substantially electrically conductive material;

an electrically-conductive sponge member disposed at least partially within said cup member;

an electrically conductive and substantially hollow stem member disposed within said vacuum bell selectively slidably receiving and holding at a lower end thereof said rod member such that said sponge member is disposed proximal to a lower open end of said vacuum bell;

third means for selectively operably connecting said hollow stem member to an external medical instrument such that said sponge member is electrically connected to said external medical instrument via said electrically conductive stem member, said rod member, and said cup member;

a substantially hollow resilient ring member secured coextensively around the periphery of said lower open end of said vacuum bell; and

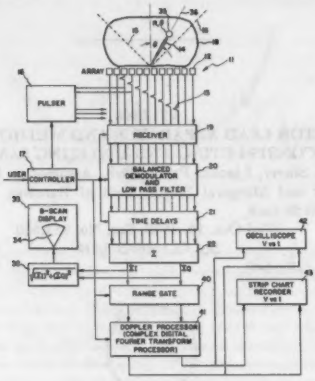
said ring member, when disposed adjacent an area of skin, is substantially collapsible upon evacuation of said vacuum bell, so as to bring said sponge member disposed proximal said lower end of said vacuum bell into contact with an area of skin.

4,217,909

DIRECTIONAL DETECTION OF BLOOD VELOCITIES IN AN ULTRASOUND SYSTEM

Emmanuel Papadofrangakis, Schenectady, and William E. Engeler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,111
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—663 **7 Claims**



1. A steered beam ultrasound instrument for measuring the velocity of flow of blood and similar liquids comprising:

a transducer array having plural electroacoustic transducer elements for transmitting pulses of ultrasound with a preselected emission frequency and for generating received echo signals,

transmitter means for sequentially exciting selected transducer elements with an element-to-element timing to generate a narrow bandwidth ultrasound pulse that propagates along a chosen radial scan line and insonifies a sample volume in the object being examined through which flow velocity toward and away from the array is being measured,

a multichannel receiver means for coherently demodulating said echo signals with phase quadrature emission frequency references and for time delaying and summing the demodulated signals to produce a focused in-phase signal and a focused quadrature signal,

a range gate for extracting a pair of analog samples in parallel from said focused in-phase and quadrature signals after every pulse transmission at a time corresponding to reception of echoes backscattered from the sample volume,

a digital complex Fourier transform processor for repeatedly and in real time deriving from sets of said pairs of analog samples the magnitude and sign of the frequency shift of echoes with respect to the emission frequency and therefore the flow velocity and direction, and

display means for visually displaying bidirectional velocity as a function of time.

4,217,910

INTERNAL JUGULAR AND LEFT VENTRICULAR THERMODILUTION CATHETER

Hassan H. Khalil, Alexandria, Egypt, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 10, 1978, Ser. No. 949,912
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—670 **11 Claims**

1. A bioelectric measuring apparatus for insertion within a living organism comprising:

an elongated, flexible, catheter body having a distal or tip end and a proximal segment;

main heating means, mounted on the distal or top end of said catheter body, for tepefying the surrounding substance of said living organism;

temperature measuring means, mounted on the proximal segment of said catheter body, for quantifying the amount of caloric energy conducted to the surrounding substance of said living organism; and

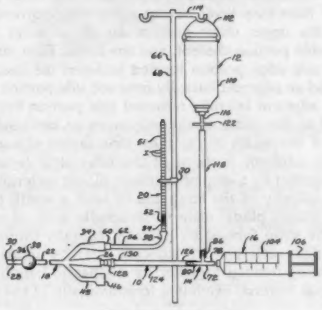
auxiliary heating means, electrically connected to said main heating means by lead wires, for providing heat to said lead wires.

4,217,911

CYSTOMETRY SYSTEM

Terry N. Layton, Arlington Heights, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Oct. 27, 1978, Ser. No. 955,723
Int. Cl.[3] A61B 10/00
U.S. Cl. 128—748 **9 Claims**



1. A system to measure the pressure-volume relationship in a body cavity of a patient, comprising:

a source of fluid;

a catheter having an elongated shaft defining an infusion lumen communicating with an infusion opening adjacent a distal end of the shaft, and a pressure lumen communicating with a pressure opening adjacent the distal end of the shaft;

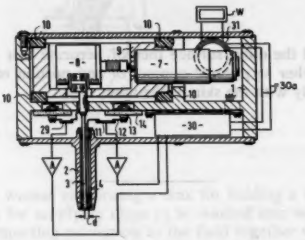
means for supplying a selected volume of fluid from the source to the cavity through the infusion lumen of the catheter comprising, pump means, and valve means communicating between said source, pump means, and infusion lumen, said valve means permitting passage of fluid from the supply to the pump means and preventing passage of fluid from the pump means to the supply, said valve means permitting passage of fluid under pressure from the pump means to the infusion lumen and preventing passage of fluid between the infusion lumen and the supply; and

means for measuring the cavity pressure through the catheter pressure lumen.

4,217,912
DEVICE FOR DETERMINATION OF THE MECHANICAL CHARACTERISTIC FREQUENCY OF BLOOD VESSELS, TENDONS, BONES OR SIMILAR ORGANS IN A BODY

Max Hubmann, Erlangen; Erich Lang, Spardorf, and Franz Menke, Neckargemünd, all of Fed. Rep. of Germany, assignors to Industrie-Automation GmbH & Co., Heidelberg, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 941,968
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741338
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—774 **9 Claims**



1. A device including a transmitter for mechanical oscillations of variable frequency and an oscillation pickup for determination of the mechanical characteristic frequency of blood vessels, tendons, bones or similar organs in a body, whereby these organs act as coupling members between the transmitter and the oscillation pickup, comprising

a support frame,

a common support tube having one end of the support tube being rigidly connected with said support frame,

a transmitter mounted in said support frame,

an oscillation pickup mounted in said support frame mutually decoupled from said transmitter,

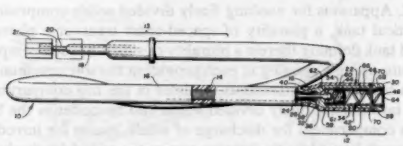
transmission means operatively connected from said transmitter to the body, and from the body to said oscillation pickup, respectively, said transmission means being mounted inside of said common support tube,

said common support tube having another end adapted to be set on the body.

4,217,913
BODY-IMPLANTABLE LEAD WITH PROTECTED, EXTENDABLE TISSUE SECURING MEANS

Robert G. Dutcher, Columbia Heights, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 839,062, Oct. 10, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,620
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—785 **18 Claims**



1. A body-implantable lead adapted to be connected at its proximal end to a medical device and secured at its distal end to tissue of a living body and thereby adapted for electrical stimulation thereof and for detecting electrical signals comprising:

an electrical conductor extending between the proximal and distal ends of said lead;

material means substantially inert to body fluids and tissue encasing said conductor;

an electrode body at the distal end of said lead having electrode means electrically connected to the distal end of said conductor and adapted to supply electrical impulses to and receive electrical signals from tissue at a desired location inside the living body, said electrode body having a chamber therein with an opening in said body;

helical tissue securing means fitting within said chamber;

a lumen extending within said material means between the proximal end of said lead and to said chamber; and

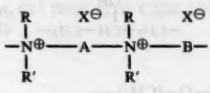
said helical tissue securing means further comprising rotatable means within said chamber adapted to be remotely engaged via said lumen and rotated with respect to said electrical conductor to advance said helical tissue securing means from said enclosed to said extended position beyond said opening.

4,217,914
QUATERNIZED POLYMER FOR USE AS A COSMETIC AGENT IN COSMETIC COMPOSITIONS FOR THE HAIR AND SKIN

Bernard Jacquet, Antony, and Gerard Lang, Deuil-la-Barre, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 577,836, May 15, 1975, abandoned. This application Nov. 8, 1977, Ser. No. 849,657
Claims priority, application Luxembourg, May 16, 1974, 70096; Feb. 14, 1975, 71849
Int. Cl.² A45D *7/00*; A61K *7/09, 7/11*
U.S. Cl. 132—7 **36 Claims**

33. A process of setting the hair comprising applying to the hair a composition comprising in a cosmetic vehicle selected from the group consisting of water, alcohol, and a hydroalcoholic solution, a quaternized polymer having recurring units of the formula

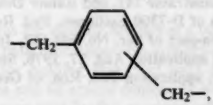


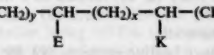
wherein

R is lower alkyl or $-CH_2-CH_2OH$;

R′ is alkyl, cycloalkyl or aralkyl containing a maximum of 20 carbon atoms, or R and R′ together with the nitrogen atom to which they are attached form a heterocycle capable of containing a heteroatom other than nitrogen;

A is a divalent group selected from the group consisting of (1) o-, m- or p-xylylidene of the formula



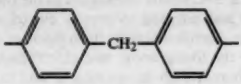


wherein x, y and t are whole numbers ranging from 0 to 11 such that the sum (x+y+t) is greater than or equal to 0 and lower than 18, and E and K represent hydrogen or alkyl having less than 18 carbon atoms,

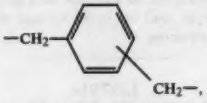
(3) $-(CH_2)_n-S-(CH_2)_n-$,

(4) $-(CH_2)_n-O-(CH_2)_n-$,

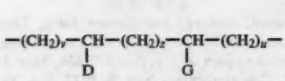
(5) $-(CH_2)_n-S-S-(CH_2)_n-$,
(6) $-(CH_2)_n-SO-(CH_2)_n-$,
(7) $-(CH_2)_n-SO_2-(CH_2)_n-$ and
(8)



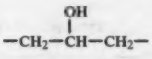
wherein n is equal to 2 or 3;
B represents a divalent group selected from the group consisting of
(1) o-, m- or p-xylylidene of the formula



(2)



wherein D and G represent hydrogen or alkyl having less than 18 carbon atoms and v, z and u are whole numbers ranging from 0 to 11, with two of v, z and u simultaneously being capable of being 0, such that the sum (v+z+u) is greater than or equal to 1 and lower than 18 and such that the sum (v+z+u) is greater than 1 when the sum (x+y+t) is equal to 0,
(3)



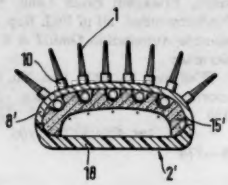
and
(4) $-(CH_2)_n-O-(CH_2)_n-$
wherein n is 2 or 3; and
$X^{\ominus}$ is an anion derived from an organic or mineral acid, said polymer having a molecular weight ranging between 5,000 and 50,000 and being present in an amount between 0.25 and 10 percent by weight of said composition, setting the hair and allowing the hair to dry.

4,217,915
HEATED HAIR BRUSH

Bernd Gress, Urbanstrasse 141, and Rainer Deüringer, Uhlandstrasse 40, both of D-7300 Esslingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 694,662, Jun. 10, 1976, abandoned. This application Aug. 17, 1978, Ser. No. 934,476
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 2526637
Int. Cl.[2] **A45D** *20/00*
U.S. Cl. 132—9 **10 Claims**

1. Electrically heated curling-type hair brush having
a bristle carrier body (2, 48) formed as a hollow structure having a outer, exposed surface (8) made of good heat conductive material,
electrical resistance heating elements (12, 50) located within the hollow structure and positioned in heat transfer relation to said exposed heat conductive surface, and
bristles (1, 41) secured to the carrier body, wherein
the bristles (1, 41) are characterized in that they comprise poorly heat conductive or heat insulating, stiffly projecting and yieldingly deflectable material and that they are located the outer, good heat conductive surface (8) uniformly distributed about the length and circumfernece of the body (2, 48) and spaced from each other to permit contact and close proximity of hair with the heated body

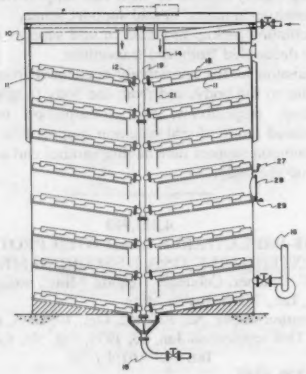


and the outer surface thereof, separate hair strands, and further to prevent contact of any portion of the heated body with the skin of the user.

4,217,916
COUNTERCURRENT WASHER

Robert C. Emmett, Jr., Salt Lake City, and Lawrence L. Tuttle, Sandy, both of Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 2, 1979, Ser. No. 25,758
Int. Cl.[3] **B08B** *3/04*
U.S. Cl. 134—104 **4 Claims**



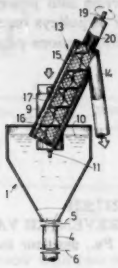
1. Apparatus for washing finely divided solids comprising a vertical tank, a plurality of spaced-apart transverse plates in said tank defining therein a plurality of superimposed compartments, a single opening in each providing the sole communication between compartments, an inlet in the top compartment for introducing finely divided solids and an outlet in the bottom compartment for discharge of solids, means for introducing wash liquid into the bottom compartment and for discharging it from the top compartment, rake means in each compartment for raking solids settled on the plate therein to said opening; and means for regulating the rate of wash liquor supply to said bottom compartment and flow through said openings to enable countercurrent flow of solids through said tank with respect to wash liquid uprising therethrough.

4,217,917

CHIP WASHER

Ossi Kilpeläinen, Savonlinna, Finland, assignor to Enso-Gutzeit Osakeyhtio, Helsinki, Finland

Filed Apr. 6, 1979, Ser. No. 27,815
Claims priority, application Finland, Apr. 10, 1978, 781091
Int. Cl.[2] B08B 3/04
U.S. Cl. 134—104 3 Claims



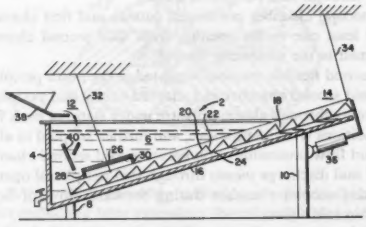
1. A chip washer comprising a tank for holding a washing fluid, means for supplying chips to be washed into said tank, means for imparting movement to the fluid together with the chips within said tank, a conduit including a valve coupled to said tank for removing foreign substances separated from the chips in said tank, and means for removing washed chips from said tank, said removing means including a flexible screw conveyor extending obliquely in the axial direction thereof relative to the surface of the washing fluid, the lower end of said screw conveyor being below the surface of the fluid, means for supporting said conveyor for rotation about its axis, a strainer tube enclosing said screw conveyor and being coaxially aligned therewith so that the inner wall of said strainer tube contacts the radially outer edge of said conveyor, said conveyor being sufficiently flexible so that its outer edge can be dragged against the inner surface of said strainer tube to prevent clogging of said strainer tube when said conveyor is rotated, and a collecting tube radially outwardly spaced from said strainer for returning washing fluid which runs off the chips through said strainer tube to said tank when the chips are being removed from said tank.

4,217,918

RATCHET CONVEYOR SYSTEM

Stuart F. Faunce, Fanwood, N.J., and Elbert R. Faust, Litchfield, Conn., assignors to Faunce and Associates, Inc., Fanwood, N.J.

Filed Aug. 16, 1979, Ser. No. 67,031
Int. Cl.[3] B08B 3/04
U.S. Cl. 134—133 10 Claims



1. An apparatus for moving articles in a continuous manner through a fluid bath, said apparatus comprising:

(a) a trough for holding said fluid bath, having an article feeding area and an article dispensing area;

(b) a ratchet conveyor having ratchet surfaces consisting of a plurality of ratchet floors and ratchet walls arranged in a stepwise fashion along a baseline, the angle of said ratchet floors to said ratchet walls being within the range of about 85° to about 95°, the angle of said ratchet floors to said baseline being within the range of about 15° to about 25°, the ratio of the length of said ratchet walls and the length of said ratchet floors being within the range of about 0.25 to about 0.6, and the angle of said baseline to the horizon being within the range of about 5° to about 45°, said ratchet conveyor being located at least partially within said trough such that the lower end of said ratchet conveyor is in said trough article feeding area and the higher end of said ratchet conveyor is in said trough article dispensing area;

(c) suspension means connected to said ratchet conveyor so as to permit movement of said ratchet conveyor cyclically through an arc; and

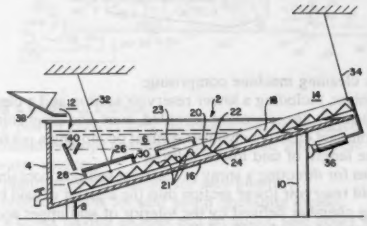
(d) drive means connected to said ratchet conveyor in a manner so as to cyclically traverse said ratchet conveyor from its initial position forwardly and upwardly through an arc, and so as to abruptly return said ratchet conveyor to its initial position to thereby cause articles on the ratchet conveyor to move successively forward thereon in a stepwise fashion, said initial position having an angle of no less than about 25° from the vertical, said arc which is traversed having an angle of no greater than about 35° and said arc which is traversed having a length adequate to move said ratchet conveyor a distance which is at least 1½ times the length of a ratchet floor.

4,217,919

RATCHET CONVEYOR AND ELECTRICAL ENERGY CLEANING SYSTEM

Stuart F. Faunce, Fanwood, N.J., and Elbert R. Faust, Litchfield, Conn., assignors to Faunce and Associates, Inc., Fanwood, N.J.

Filed Aug. 16, 1979, Ser. No. 67,032
Int. Cl.[3] B08B 3/10; C25D 17/00
U.S. Cl. 134—133 10 Claims



1. An apparatus for moving articles in a continuous manner through a fluid bath, said apparatus comprising:

(a) a trough for holding said fluid bath, having an article feeding area and an article dispensing area;

(b) a ratchet conveyor having ratchet surfaces consisting of a plurality of ratchet floors and ratchet walls arranged in a stepwise fashion along a baseline, the angle of said ratchet floors to said ratchet walls being within the range of about 85° to about 95°, the angle of said ratchet floors to said baseline being within the range of about 15° to about 25°, the ratio of the lengths of said ratchet walls to the length of said ratchet floors being within the range of about 0.25 to about 0.6, and the angle of said baseline to the horizon being within the range of about 5° to about 45°, said ratchet conveyor being located at least partially within said trough such that the lower end of said ratchet conveyor is in said trough article feeding area and the higher end of said ratchet conveyor is in said trough

article dispensing area, said ratchet conveyor having at least a portion thereof which is nonconductive;

(c) electrical energy cleaning means including a plurality of electrodes, at least one of which is located substantially at said nonconductive portion of said ratchet conveyor, said means capable of passing electrical current between said electrodes while in a fluid bath and at a current density sufficient to enhance cleaning of said articles;

(d) suspension means connected to said ratchet conveyor so as to permit movement of said ratchet conveyor cyclically through an arc; and,

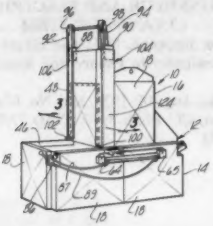
(e) drive means connected to said ratchet conveyor in a manner so as to cyclically traverse said ratchet conveyor from its initial position forwardly and upwardly through an arc, and so as to abruptly return said ratchet conveyor to its initial position to thereby cause articles on the ratchet conveyor to move successively forward thereon in a stepwise fashion, said initial position having an angle of no less than about 25° from the vertical, said arc which is traversed having an angle of no greater than about 35° and said arc which is traversed having a length adequate to move said ratchet conveyor a distance which is at least 1½ times the length of a ratchet floor.

4,217,920

CLEANING MACHINE WITH EXTERNALLY MOUNTED TURNTABLE TROLLEY OPERATOR

Thomas B. Ballard, 25550 Mulberry Dr., Southfield, Mich. 48075

Filed Jun. 4, 1979, Ser. No. 44,891
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—141 **9 Claims**



1. A cleaning machine comprising:

a cabinet, including a lower reservoir section and a cleaning chamber upper section mounted over said reservoir section, said cleaning chamber cabinet occupying a portion of the length of said lower section;

means for directing a spray of cleaning solution contained in said reservoir lower section into the interior of said cleaning chamber defined by the interior of said upper section;

a frontal access door formed in said cleaning chamber cabinet section adjacent said portion of said reservoir lower section not covered or occupied by said cleaning chamber cabinet section;

means movably mounting said frontal access door to provide access to the interior of said cleaning chamber cabinet section;

a work holder adapted to support workpieces during cleaning operations in said cleaning chamber and means supporting said work holder on said reservoir lower section, said means including a trolley and means supporting said trolley for linear movement within said reservoir lower section between advanced positions disposed beneath said cleaning chamber upper section and a retracted loading position without said cleaning chamber upper section;

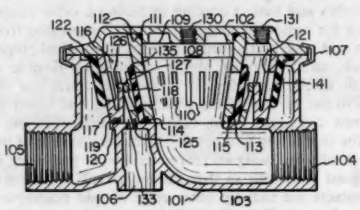
a power operating mechanism for positioning said trolley between said advanced and retracted positions, said arrangement comprising a cylinder mounted exteriorly of said cleaning machine cabinet with its axis parallel to said direction of movement of said trolley within said cabinet reservoir section, said power cylinder having an actuating element reciprocated by actuation of said power cylinder means, said power operating arrangement further including means drivingly connecting said trolley with said actuating element of said power cylinder means producing corresponding movement thereof, whereby said trolley may be positioned by actuation of said power cylinder means, and wherein said actuating element comprises a flexible cable loop wherein said power cylinder means further includes a a pair of pulleys receiving a section of said loop and each of said sections passing along side of said cylinder.

4,217,921

BACK FLOW PREVENTER VALVE

Robert R. Gidner, Fairview, Pa., assignor to Zurn Industries, Inc., Erie, Pa.

Filed Jun. 16, 1978, Ser. No. 916,241
Int. Cl.[3] F16K *24/00*
U.S. Cl. 137—218 **12 Claims**



1. A back flow preventer valve comprising:

(a) a valve body;

(b) an inlet means in said valve body adapted for communication with a liquid source;

(c) a discharge means in said valve body adapted to dispense liquid;

(d) a first chamber in fluid communication with said inlet means;

(e) at least one outlet from said first chamber formed in the periphery thereof;

(f) a first flexible member mounted at the outer periphery of said first chamber and adapted to seal said peripheral opening through elastic pressure under static or back flow pressure conditions within said valve, and further adapted to allow liquid flow communication from said first chamber through said peripheral outlet;

(g) a second chamber positioned outside said first chamber;

(h) at least one outlet opening from said second chamber formed in the periphery thereof;

(i) a second flexible member mounted at the outer periphery of said second chamber and adapted to seal said peripheral opening through elastic pressure under static or back flow conditions within said valve, and further adapted to allow liquid flow communication between said second chamber and said discharge means through said peripheral opening in said second chamber during forward flow of liquid within said valve;

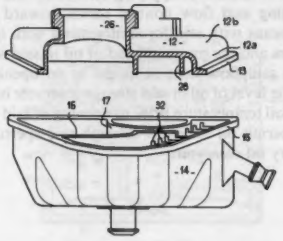
(j) an atmospheric vent from said second chamber; and

(k) a sealing means within said second chamber adapted to engage said first flexible member adapted to seal liquid flow communication from said second chamber to said atmospheric vent upon forward flow of liquid from said first chamber to said second chamber.

4,217,922
FLUID RESERVOIR

Philippe Come, Dammartin en Goelle, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Mar. 26, 1979, Ser. No. 23,791
Int. Cl.[2] B65D 1/24; F15B 7/10
U.S. Cl. 137—265 6 Claims

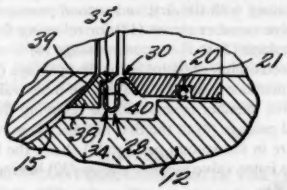


1. A fluid reservoir with two compartments, more particularly for supplying hydraulic fluid to tandem master cylinders, comprising two complementary, superjacent parts connected with adhesive, by thermowelding or by any other equivalent method, a central partition attached to the said parts and running across the longitudinal axis of the reservoir to divide the reservoir interior into two compartments having respective outlet orifices, at least one compartment also having a filler orifice, and the two compartments being interconnected by a transfer passage which extends into both of them and runs parallel to the surface of the fluid in the reservoir and substantially at the maximum level for this fluid, characterised in that the transfer passage (22) itself comprises two complementary, superjacent, profiled portions, namely a lower portion (30) substantially forming a gutter mounted on the lower part (14) of the reservoir and an upper portion attached to the upper part (12) of the reservoir, the said portions together defining a closed cross-section, and the connection plane of the portions making up the passage coincides at least approximately with that of the parts making up the reservoir, so that the whole can be assembled in a single operation.

4,217,923
BALL VALVE WITH READILY REMOVABLE BALL AND SEATS FOR HIGH TEMPERATURE ENVIRONMENT

Peter G. Kindersley, Glens Falls, N.Y., assignor to Kamyr Valves, Inc., Glens Falls, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,773
Int. Cl.[2] F16K 43/00
U.S. Cl. 137—315 10 Claims



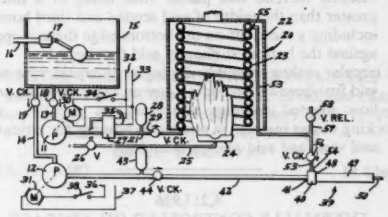
1. A ball valve assembly including a valve body having a fluid-conducting bore extending therethrough along an axis, a metallic ball having spherically curved portions and disposed within said valve body and having a bore therethrough adapted to cooperate with said valve body bore, a valve stem attached to said ball and extending generally perpendicularly to the axis of the fluid-conducting bore through said valve body, a pair of annular metallic valve seat supports of said valve body, each seat support having a sperically curved annular end portion thereof facing said ball, and sealing means disposed between said ball and each sperically curved annular portion of said seat supports:

said sealing means comprising a spring metallic, all metal, bellows disposed between each seat support and said ball and concentric with each said seat support; each said bellows consisting of a concave spherical first end portion extending toward each said seat support, corresponding to the spherical curvature of said support portion annular end portion and in non-affixed abutting engagement with said seat support annular end portion to provide a fluid-tight metal-to-metal seal with said seal support; a second end portion, a line parallel to said valve body bore passing through said bellows end portions; and at least one convolution disposed between and radially outward of said end portions; and wherein said bellows second end portion is operatively associated with a rigid metallic annular member concentric with said seat support and disposed between each bellows and said ball, each said rigid metallic annular member comprising a first, spherically curved annular surface corresponding in curvature to the spherical curvature of said ball and in metallic fluid-tight engagement therewith, and a second annular surface in operative association with said bellows second end.

4,217,924
CLEANING SYSTEM HAVING STEAM AND WATER MIXING EJECTOR

John F. Finger, 308 S. Third St., Beresford, S. Dak. 57004

Filed Dec. 8, 1977, Ser. No. 858,882
Int. Cl.[2] F16K 49/00
U.S. Cl. 137—334 8 Claims



1. In a cleaning system:

(a) a pair of respectively relatively low and relatively high pressure pumps adapted to deliver cold water from a cold water source;

(b) pump operating means for said pumps;

(c) control means for said pump operating means;

(d) a boiler having an inlet and an outlet, said boiler including heating means operable to convert said cold water entering said inlet into steam which is delivered to said outlet;

(e) first conduit means for delivering said cold water from said low pressure pump to said boiler inlet;

(f) an ejector including a housing defining a chamber, a relatively small diameter high pressure inlet passageway to one side of said chamber, a relatively large diameter outlet passageway from the opposite side of said chamber and aligned with said high pressure inlet passageway, and a lower pressure inlet passageway to said chamber angularly displaced from said inlet and outlet passageways;

(g) second conduit means for delivering said cold water from said high pressure pump to said high pressure inlet passageway;

(h) and third conduit means connecting said boiler outlet to said lower pressure ejector inlet passageway, wherein the pressure of said steam entering the lower pressure inlet passageway of the ejector is substantially relatively lower

than the pressure of the cold water entering the high pressure inlet passageway;

(i) said control means being operative to deliver both said steam and said cold water together, and selectively, said cold water alone and said steam alone, to said ejector chamber.

4,217,925

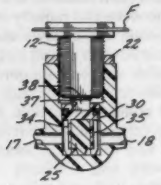
GASOLINE LINE LOCK

Bob Clark, 9156 Rose St., Bellflower, Calif. 90706

Filed Sep. 22, 1978, Ser. No. 944,753

Int. Cl.[2] **B60R** *25/04;* **E05B** *65/12;* **F16K** *5/00, 35/00*

U.S. Cl. 137—385 **4 Claims**



1. A lock articulated valve adapted for installation into the gasoline line of an automobile, comprising:

a valve housing having a first bore extending partly into the interior thereof and second and third bores axially aligned relative each other and communicating from opposed directions with said first bore along an axis normal thereto;

a planar vane received in said first bore and adapted for rotation therein, said planar vane being of a thickness greater than the width of said second and third bores and including a stand-off on the bottom edge thereof opposed against the bottom surface of said first bore;

a circular sealing assembly deployed over said vane within said first bore and including downwardly directed projections adapted to engage said vane; and

locking means inserted in said valve housing for articulating said vane and said sealing assembly.

4,217,926

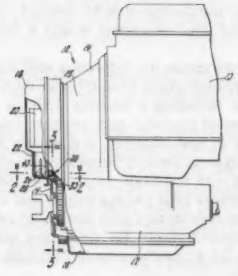
THERMALLY CONTROLLED OIL STORAGE RESERVOIR FOR A TRANSMISSION

Jack H. Van Gorder, Chelsea, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1978, Ser. No. 964,595

Int. Cl.[2] **G05D** *9/00;* **F16K** *49/00*

U.S. Cl. 137—389 **3 Claims**



1. A thermally controlled oil storage reservoir for a transmission comprising; a transmission housing; a primary oil reservoir disposed below said transmission housing; a source of oil pressure and passage means for said transmission including an oil return passage; a storage reservoir in communication with said return passage, disposed on said transmission housing above said primary oil reservoir and having aperture means in communication with said primary oil reservoir; flow control means for closing said aperture means to control oil flow from said storage reservoir to said primary reservoir; and thermostatic element means for applying a force to said flow control means urging said flow control means toward closing said aperture means with said force increasing with increasing oil temperature and the pressure head of oil in said storage reservoir urges said flow control means in an opening direction whereby the level of oil in said storage reservoir increases with increasing oil temperature prior to opening of said flow control means to permit oil to return through said aperture means to said primary oil reservoir.

4,217,927

RELIEF AND MAKE-UP VALVE ASSEMBLY

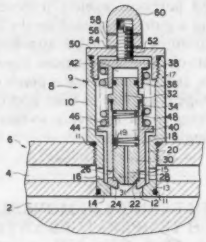
Izuru Morita, Sagamihara, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 916,458

Claims priority, application Japan, Jun. 24, 1977, 52-74449

Int. Cl.[3] **F16K** *17/196*

U.S. Cl. 137—493.3 **8 Claims**



1. A relief and make-up valve assembly (**8**) connecting first and second passages (**2,4**) in a fluid pressure device (**6**), the valve assembly comprising:

a hollow housing (**10**) having an outer valve seat (**14**) communicating with the first and second passages (**2,4**);

outer valve member means (**18**) for relieving fluid from the first passage (**2**) to the second passage (**4**) in response to a preselected high pressure in the first passage (**2**), the outer valve member means (**18**) having an inner valve seat (**24**);

inner valve member means (**30**) for relieving fluid from the second passage (**4**) to the first passage (**2**) in response to a pressure in the second passage (**4**) above the first passage (**2**), the inner valve member means (**30**) having a through-hole (**28**);

a reaction chamber (**40**) in continual communication with the first passage (**2**) through the through-hole (**28**) in the inner valve member means (**30**), the outer valve member means (**18**) being urged toward the outer valve seat (**14**) in response to the pressure in the reaction chamber (**40**);

first spring means (**46**) for resiliently urging the outer valve member means (**18**) against the outer valve seat (**14**); and

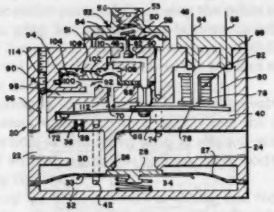
second spring means (**48**) for resiliently urging the inner valve member means (**30**) against the inner valve seat (**24**).

4,217,928

GAS REGULATOR VALVE WITH STEP OPENING CHARACTERISTIC

Samuel T. Kelly, Torrance, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 31, 1978, Ser. No. 938,651
Int. Cl.[2] F16K *31/02*
U.S. Cl. 137—495 **12 Claims**



1. A fluid flow regulator comprising:
(a) a housing having fluid inlet and outlet ports;
(b) a first diaphragm and a valve member carried thereon mounted in said housing and cooperative valve seat means to provide a main fluid valve between said inlet and outlet ports;
(c) a main valve operating chamber within said housing enclosed by said first diaphragm;
(d) a bleed chamber within said housing in open communication with said inlet through bleed orifice means and in open communication with said main valve operating chamber and snap valve means seated in a snap valve port defined in the structure of said housing;
(e) a bleed outlet passageway communicating from said bleed chamber through said snap valve means and through said regulator valve means to a discharge passageway in communication with said outlet port of said housing;
(f) means biasing said snap valve means closed and actuator means to open said snap valve means;
(g) a second diaphragm for said regulator valve means including a diaphragm pressure chamber enclosed by said diaphragm and in open communication with said discharge passageway downstream of said regulator valve; and
(h) a bypass cavity within said housing and a bypass passageway communicating between said inlet port and said bypass cavity and said bleed chamber independently of said bleed orifice means and of said snap valve port and including bypass valve means with a third diaphragm operator comprising a bypass valve in said bypass cavity of said housing subdivided by the diaphragm of said third diaphragm operator into a first bypass pressure chamber in open communication with said bleed chamber and a second bypass pressure chamber in communication through delay orifice means with said bleed outlet passageway between said snap valve and regulator valve means and said snap valve means and said snap valve port being spaced and separate from said bypass valve means.

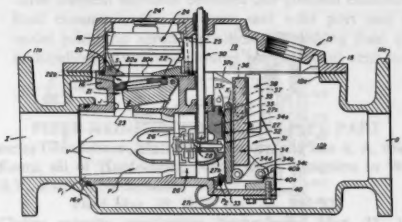
4,217,929

FLOW CONTROL COMPOSITE VALVE

Thomas E. Pelt, Milwaukee, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Division of Ser. No. 746,537, Dec. 1, 1976, Pat. No. 4,100,800. This application Apr. 17, 1978, Ser. No. 897,190
Int. Cl.[2] F16K *15/03*; G01F *7/00*
U.S. Cl. 137—527.8 **13 Claims**

1. A flow control assembly including a composite valve responsive to liquid flow and to gravity, said composite valve comprising: a valve seat circumscribing an outlet passage and oriented to face downstream; a closure member mounted within said assembly on the downstream side of said seat and movable towards and away from said seat for engagement therewith to close and open said outlet passage in response to pressure differentials across said closure member; stationary means mounted within said assembly downstream from said closure member; a weighted member disposed within said assembly downstream from said closure member, said weighted member being separate from said stationary means



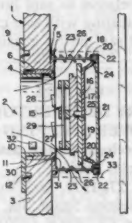
and said closure member; and means mounting said weighted member for movement by gravity against said closure member to urge said closure member toward said seat against liquid flow through said outlet passage, said mounting means permitting generally downward wedging movement of said weighted member by gravity into wedging engagement between said closure member and said stationary means as said closure member engages said seat to hold said closure member against said seat by such wedging engagement.

4,217,930

VENTING PORT FOR SHIPPING CONTAINERS

Marc Lerner, Star Route, Swan Lake, N.Y. 12783, and Charles Dallas, 1269 N. Pierce Ave., North Bellmore, N.Y. 11710

Filed Sep. 28, 1978, Ser. No. 946,704
Int. Cl.[2] F16K *15/18*
U.S. Cl. 137—587 **11 Claims**

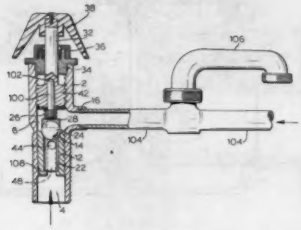


1. A venting port for a shipping container having an opening formed in a wall thereof comprising, in combination, a pair of flanged rings defining a central port and adapted to extend through the opening in the container wall and sandwich the wall therebetween; a closure rotatably disposed on the inner side of the wall and movable between a closed position in which the closure engages one of said flanged rings to seal the central port and an open position in which the closure is spaced apart from said flanged rings to permit ambient air to enter the container; means for guiding the closure between the open position and closed position; and locking means formed as a plurality of cooperating elements on one of said flanged rings and said closure for securing the closure in the closed position upon rotation thereof.

4,217,931
ADJUSTABLE CHECK VALVE

Gunter Jaekel, 44 Coral Gable Dr., Weston, Ontario, Canada

Continuation-in-part of Ser. No. 789,992, Apr. 22, 1977, Pat. No. 4,112,959. This application Sep. 8, 1978, Ser. No. 940,824
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.³ F16K *15/04, 47/08*
U.S. Cl. 137—606 7 Claims



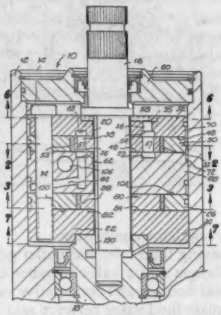
1. A check valve comprising a valve housing having an inlet and an outlet, a valve seating in the housing defining a passage between inlet and outlet chambers defined in said housing, a ball valve seatable on the seating on the outlet side thereof, a compression spring urging the ball onto the seat, a movable abutment mounted in the housing and comprising a stem having a threaded portion rotatable in a thread defining means in the body and extending out of the body through a gland attached to the latter, the spring acting between the ball and the abutment to apply an adjustable bias to said ball tending to retain it on said valve seat, a first piston having a path of movement in the passage defined by the valve seating, passageway means defined by the piston and extending from an inlet in the one end of the piston nearest the inlet to at least one outlet in the side of the piston and so positioned that at one end of the path of movement of the piston the outlet is wholly within the passage in the valve seating and obturated by the latter and at the other end of the travel of the piston is on the outlet side of the valve seat, the other end of the piston being engagable with the ball valve member, and dashpot means comprising a second piston, constrained to move conjointly with said ball and said first piston, and cylinder means receiving said second piston for movement relative to said housing, a leakage path being defined communicating with said cylinder to control the rate of displacement of said piston in said cylinder.

4,217,932
HYDRAULIC ROTARY DISTRIBUTOR, PARTICULARLY FOR USE IN POWER STEERING MECHANISMS

Juan S. Bacardit, Barcelona, Spain, assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 27, 1979, Ser. No. 61,540
Claims priority, application Spain, Jul. 27, 1978, 72.088
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.21 16 Claims

1. A hydraulic rotary distributor for power-assisted steering gear, comprising a housing inside which are disposed a first rotary member connected to an input shaft, and a second rotary member, coaxial to the first rotary member and connected to an output shaft, between which are defined at least one pair of working chambers comprising a first working chamber intended to be put into communication with a first compartment of a double-action hydraulic motor and a second working chamber intended to be put into communication with the second compartment of the said motor, the said distributor being responsive to a relative rotation of one of the rotary members in relation to the other from a non-operating position so as to put one of the first and second working chambers in communication with a source of high pressure and so as to put the other working chamber in communication with a source of low pressure, the said distributor further comprising at least one rotary element solid in rotation with one of said shafts and cooperating with the rotary member connected to the other of said shafts so as to define at least one pair of reaction chambers comprising a first reaction chamber connected to the first working chamber, and a second reaction chamber connected to the second working chamber, the reaction chambers being disposed in such a way that the high pressure transmitted to one of said first and second reaction chambers via its associated

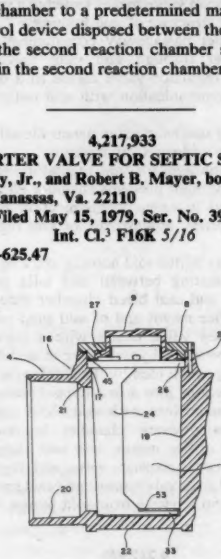


working chamber in response to the relative rotation of one of the rotary members in relation to the other opposes said relative rotation, said distributor also comprising a first control device disposed between the first working chamber and the first reaction chamber so as to limit the fluid pressure in the first reaction chamber to a predetermined maximal value, and a second control device disposed between the second working chamber and the second reaction chamber so as to limit the fluid pressure in the second reaction chamber to the said maximal value.

4,217,933
DIVERTER VALVE FOR SEPTIC SYSTEMS

Carlos V. Perry, Jr., and Robert B. Mayer, both of 8012 Centreville Rd., Manasssas, Va. 22110

Filed May 15, 1979, Ser. No. 39,198
Int. Cl.³ F16K *5/16*
U.S. Cl. 137—625.47 13 Claims



1. A diverter valve adapted for use in septic systems operating under positive pressures, for controlling the flow of effluent from a septic tank to a plurality of leach beds, comprising:

a thick-walled injection molded plastic valve body, closed at the bottom and having a vertically disposed central valve chamber, said valve body having a inlet port and a plurality of outlet ports,

integrally formed ribs extending inwardly from the top to the bottom walls of the valve body, dividing the central

chamber into separate inlet and outlet chambers communicating with the central valve chamber,

a circular opening in the top of the valve body adapted to receive an injection molded tapered valve plug and stem, the latter having an upwardly extending projection adapted to receive a slotted tool to actuate the valve plug and stem from ground level, the walls of the valve body providing bearing surfaces for the valve plug,

a valve plug having a cut-away central portion providing a passageway for alternately connecting the inlet port with one of the outlet ports while closing the other outlet ports, the valve plug having top and bottom circular sections mounted for partial rotative movement in sliding contact with the valve bearing surfaces in the top and side walls of the valve body,

means for pressing the bearing surfaces of the valve plug into close contact with the valve body when the central cut-away portion of the valve plug is aligned with the inlet port and with an outlet port of the valve body, to form a relatively tight seal,

a retainer cap for securing the valve plug and stem in operative position, said cap having a depending tapered ring portion contacting the top surface of the valve body and the upper circular portion of the valve plug to form a relatively tight seal, the upper external circular portion of the valve body adapted to accomodate access means of differing dimensions.

4,217,934

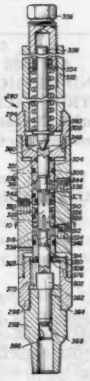
PILOT VALVE MECHANISM FOR HIGH OR LOW PRESSURE CUT-OFF CONTROL

Clifford M. Peters, Longview, Tex., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Continuation of Ser. No. 888,092, Mar. 20, 1978, abandoned, which is a continuation of Ser. No. 741,925, Nov. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 560,598, Mar. 21, 1975, Pat. No. 3,996,965, which is a continuation of Ser. No. 410,182, Oct. 26, 1973, abandoned. This application Jan. 23, 1979, Ser. No. 8,197

Int. Cl.³ F16K *11/02, 31/122*

U.S. Cl. 137—625.66 **5 Claims**



2. A quick bleeding pressure responsive pilot valve mechanism for rapidly bleeding a pilot controlled control pressure system responsive to sensing of an unsafe condition in a pressurized primary system, said pilot valve mechanism comprising:

an elongated hollow intermediate body portion having a longitudinal extending central opening and internally threaded ends, said intermediate body portion having an inlet port, an outlet port and a vent port in communication with the longitudinal opening;

a pair of externally threaded end sections in threaded engagement with the internally threaded ends of the intermediate body portion, each end section having an integral sleeve extension fitting within the opening of the body portion, said sleeve extensions forming a central bore defining a valve chamber and being in closely spaced end-to-end relation at the outlet port to define the size of the outlet port; and

an elongated shuttle valve element positioned within the central bore defined by the sleeve extensions, said shuttle valve element movable between one position establishing fluid communication between said inlet port and said outlet port, and another position establishing fluid communication between said outlet port and said vent port.

4,217,935

FIBER REINFORCED PLASTIC PIPE PART

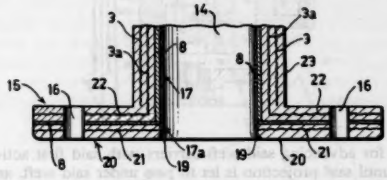
Mannes Grendelman; Mattheus J. Poiesz, and Leo A. A. van der Kemp, all of Hardenberg, Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Filed Mar. 30, 1978, Ser. No. 891,527

Claims priority, application Netherlands, Mar. 31, 1977, 7703545; Mar. 31, 1977, 7703546

Int. Cl.² F16L *9/12*

U.S. Cl. 138—109 **4 Claims**



1. A pipe piece formed of a fiber-reinforced plastic thermosetting resin, the pipe piece comprising a first pipe part having a first inner wall surface comprising a primary non-woven layer of C-glass fiber extending parallel to the longitudinal axis of the first pipe part, and a second adjoining pipe part being a flange having a second wall surface, the first and second wall surfaces extending transversely to each other and being connected through a rounded transition corner, the corner having a radius of curvature of from 0.5 mm. to 3 mm; and wherein said first pipe part further comprises a plurality of secondary layers of helically overlapping glass filaments embedded in thermosetting resin, said second pipe part comprising a plurality of secondary layers of glass filaments embedded in thermosetting resin.

4,217,936

WEAVING MACHINES OF THE NON-RECIPROCATING CONTINUOUS TYPE

Vinicio Luchi, Via Firenze 40H, Prato, Firenze, Italy

Continuation of Ser. No. 794,232, May 5, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 954,835

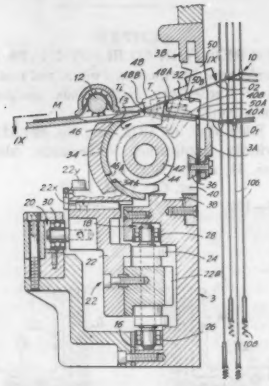
Claims priority, application Italy, May 13, 1976, 9448 A/76

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 **1 Claim**

1. In an improved weaving apparatus of the non-reciprocating continuous type employing, heald loops for controlling warps; weft-carriers slidable in an annular track each to deposit a weft; a series of weft-carrier thrust elements, said thrust elements being successively movable to form a thrust wave for advancing each weft-carrier across the warps, and weft-tank bobbins on said weft-carriers; shaft means forming a support for laminar elements defining seats for said thrust elements; said laminar elements including ring means and lower stationary blade means supporting said shaft means and defining a lower supporting surface of said weft-carriers; said ring means

and said lower blade means being cooperating with each other to define annular seats for said thrust elements along said shaft means; said improvement comprising: having said thrust elements as arcuate sinkers with an arcuate development not greater than 180° to be slidably movable in said annular seats and capable of being radially removed from said seats; each of said arcuate sinkers having corresponding control butt and an end projection with a first radial edge active on the weft-carriers, and with a second about a radial opposite edge active on weft being distributed, to beat-up the weft against fabric being formed; stationary lateral blades forming a weft-carrier guide surface; means for rocking said sinkers to urge each sinker through an advancing stroke toward said stationary lateral



blades for advancing said weft-carriers with said first active edge, until said projection is let to pass under said weft, and through a return stroke, to beat-up the weft against the fabric; said means for urging said sinkers being defined by control track means engageable with said sinker control butts, and being mounted on an endless chain means; control elements defined by partial-cylindrical surfaces facing said annular seats and having said control track means extending along said partial-cylindrical surfaces; said control elements being carried removably and adjustably toward and from said annular seats on means formed of said chain; said chains being provided with guide and thrust rollers; and stationary tracks mounted on said apparatus for cooperating with said guide and thrust rollers.

4,217,937

COIL WINDING MACHINE

Richard P. Ache, Bechtelsville; Stanley Gartner, Emporium, both of Pa., and Alexandre Nissen, Paris, France, assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 23, 1979, Ser. No. 15,504
Int. Cl.³ B21F *3/00*
U.S. Cl. 140—92.1 **1 Claim**

1. An apparatus for winding saddle shaped coils containing multiple turns of at least one strand of wire and having front and rear arcuate lobes connected by substantially longitudinal portions comprising:

a supply of wire;

a winding head to which wire from said supply is fed;

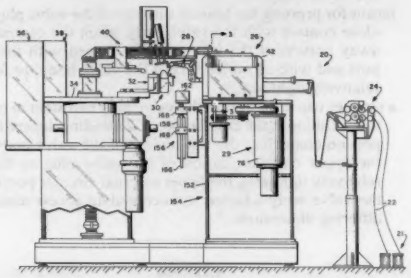
a wire tensioning device positioned between said winding head and said supply;

a winding pattern generator operatively connected to said winding head positioned between said winding head and said tensioning device;

driving means for said winding pattern generator comprising a high torque, low inertia, digitally driven motor; and

a coil mould indexable into and out of position at a winding station operatively functional with said winding head said winding head comprising means for moving said winding head in sequential arcuate and longitudinal movements to form said coil in said mould, said last named means comprising:

a hollow, substantially longitudinally extending shaft having said winding head affixed at one end thereof, said shaft being mounted to permit reciprocal longitudinal movement and arcuate movement, said at least one strand of wire being fed through said hollow shaft; a carriage mounted on said shaft in a manner to move reciprocally with said shaft while permitting said shaft arcuate movement, and motion providing means operatively connected to said carriage; said motion providing means comprises a driven chain and a plurality of cooperating sprockets so



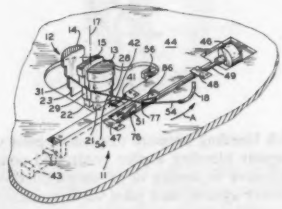
spaced as to define a path for said chain; one link of said chain carrying a slide which cooperates with a slideway in said carriage; said carriage having opposed idler pulleys at the ends thereof; said shaft having a threaded pulley mounted thereon to cause rotation of said shaft; and a cable passing over said idler pulleys and said threaded pulley, the ends of said cable being fixed in said slide, whereby chain caused movement of said slide in a direction transverse to said slideway causes longitudinal movement of said shaft, and chain caused movement of said slide in a direction along said slideway causes rotational movement of said shaft thru the medium of said cable and pulleys.

4,217,938

APPARATUS AND METHOD FOR MAKING DYNAMOELECTRIC MACHINE WINDINGS

Eugene R. Barrett, Columbia City, and Richard B. Arnold, Fort Wayne, both of Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Mar. 12, 1979, Ser. No. 19,835
Int. Cl.³ B21F *3/00*; H02K *15/04*
U.S. Cl. 140—92.1 **40 Claims**



1. A method of developing at least one coil group for a dynamoelectric machine stator, the at least one coil group comprising at least one coil having a plurality of turns, the method involving utilization of winding equipment and comprising the steps of: generating a number of winding turns for

a given coil by relatively rotating wire dispensing means and form means so as to generate turns in a predetermined winding plane, whereby turns move away from the plane and toward a turn receiver spaced from the winding plane; generating a portion of a final turn of the given coil; and deflecting out of the winding plane and away from the turn receiver a segment of wire extending between the dispensing means and form means while relative motion between the dispensing means and form means continues, thereby to at least assist in the accurate placement of such segment relative to at least the form means.

20. In apparatus for developing a plurality of coil groups for dynamoelectric machines wherein each coil group comprises at least one coil of a plurality of turns of magnet wire and adjacent coil groups are interconnected by interpole wire segments; and wherein the apparatus includes turn sizing means for determining the size of winding turns, magnet wire dispensing means movable relative to the turn sizing means for generating winding turns in a predetermined winding plane, turn receiving means for receiving winding turns from the turn sizing means while other subsequent winding turns are being generated, and clamp means for clamping the interpole wire segments, the improvement comprising: abutment means for intercepting an interpole wire segment extending between said dispensing means and turn sizing means before cessation of relative movement between said turn sizing means and said dispensing means, and for aligning the interpole wire segment with said clamp means.

4,217,939

METHOD FOR MANUFACTURING ELECTRODE FOR BATTERY

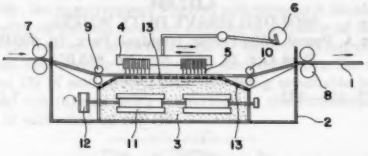
Nobuyuki Yanagihara, Hirakata; Isao Matsumoto, Osaka; Mamoru Ishitobi, Neyagawa, and Tsutomu Iwaki, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 18, 1978, Ser. No. 952,542

Claims priority, application Japan, Oct. 20, 1977, 52-126561; Oct. 20, 1977, 52-126562; Oct. 28, 1977, 52-130047; Oct. 28, 1977, 52-130048

Int. Cl.³ H01M *4/82*

U.S. Cl. 141—1.1 **7 Claims**



1. In a method for manufacturing a battery electrode made of foam metal having a three-dimensional structure with continuously interlinked pores, said foam metal being impregnated with an active material, the improvement which comprises the steps of:

a. providing a vessel containing a body of said active material in paste form and, above said body of active material but within said vessel, a perforated plate;

b. causing a belt of said foam metal to continuously move over the surface of said perforated plate;

c. causing said active material in paste form to flow from said vessel upwardly and around the periphery of said foam metal to be provided to the top surface of said foam metal at right angles to the direction of movement of said foam metal, and then into the interior of said foam metal, with a portion of said paste returning to said vessel from the underside of said foam metal, said flow being caused by stirring said paste within said vessel in a direction normal to the direction of movement of said foam metal thereby creating a zone of reduced pressure about the central portion of the underside of said foam metal; and

d. further urging said active material in paste form into the pores of the top surface of said foam metal by sliding a scrubber comprising a plurality of spatulas along said top surface of said foam metal in a reciprocal manner, horizontally and parallel to the direction of movement of said foam metal, and wherein

i. said belt of foam metal being contacted with a liquid prior to step c. whereby the liquid content of the pores of said foam metal is 20 to 60% by volume, the affinity of said pasted active material for said foam metal thus being increased;

ii. the speed of the scrubber being correlated to the amplitude of its movement and the rate of its reciprocation being defined by the formula $Y=2aX$, in which Y is the speed of the scrubber in cm/sec, a is the amplitude of the scrubber in cm. and X is the number of cycles per second;

whereby said active material is impregnated with in said foam metal uniformly and in high quantity.

4,217,940

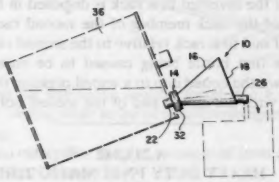
FUNNEL HAVING AN INTEGRAL POURING SPOUT

Markham L. Wheeler, 6930 S. Columbia, Tulsa, Okla. 74136

Filed Apr. 26, 1976, Ser. No. 680,168

Int. Cl.² B65B *3/04*

U.S. Cl. 141—98 **2 Claims**



1. A funnel having an integral pouring spout comprising:

a base portion having a funnel configuration providing a large open top and tapering downwardly to a reduced dimensioned open bottom; and

a spout portion affixed to the tapered interior surface of the base portion, the spout portion being open at the bottom and forming an open ended conduit at the top, the conduit terminating above the open top of said base portion, the bottom of the spout portion having spaced apart sidewalls flared outwardly and partially around the lower interior surface of the base portion, the sidewalls tapering towards the conduit to funnel fluid out of said base portion open bottom to said conduit when the funnel is tilted downwardly in the direction of the spout portion.

4,217,941

KETCHUP RAPPING APPARATUS

Vitale Catalano, 1301 57th St., Brooklyn, N.Y. 11219

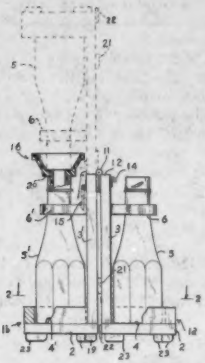
Filed Dec. 1, 1978, Ser. No. 965,527

Int. Cl.³ B65B *3/06*; B67C *3/02*

U.S. Cl. 141—372 **11 Claims**

9. Apparatus for effecting a vertical inversion of a narrow-necked ketchup first bottle relative to a narrow-necked ketchup second bottle so as to allow gravity flow of the contents of the inverted first bottle down into the second bottle, the apparatus comprising a first and a second L-form rack, each rack having a base member and an upright back member and adapted to have seated on its base member one of the bottles in a restrained upright normal position, a truncated coned cup opening at its bottom into a depending tube, the tube being receivable in the mouth end of the second bottle, the coned cup being adapted for reception of the mouth end of the first bottle upon relative inversion of the latter bottle, a hinge connecting upper ends of the back members of both racks

together enabling pivoting of the first rack and the first bottle seated therein from a back-to-back normal position of both racks to an inverted position relative to the second rack, in which position the base member of the inverted first rack is disposed in an overhead aligned spaced relation to the base member of the second rack and in which position the back



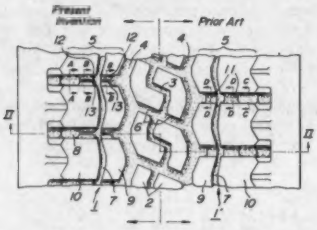
member of the inverted first rack is disposed in linear vertical extension of the back member of the second rack, and in the pivoting of said first rack relative to the second rack the mouth end of the first bottle being caused to be entered into and guided down the coned cup to a seated position therein in axial alignment with the mouth end of the second bottle.

4,217,942

HEAVY DUTY PNEUMATIC TIRE

Hiroyoshi Takigawa, and Toshiro Tezuka, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 961,069
Claims priority, application Japan, Nov. 17, 1977, 52-137232
Int. Cl.³ B60C *11/04, 11/08*
U.S. Cl. 152—209 R **6 Claims**



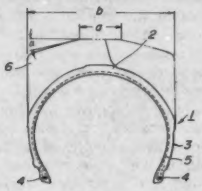
1. In the heavy duty pneumatic tire having a shoulder portion, a tread pattern having rows of projections arranged independently and spaced apart from each other in the circumferential direction of the tire, and transverse grooves for separating the projections one from the other, the improvement comprising; projections defining a row nearest said shoulder portion being separated from each other by transverse grooves communicating with and opened to said shoulder portion, said protections provided with a buttress nestling from the bottom of said transverse groove along the groove wall thereof and being partly united with the groove wall, and said buttress extending toward the direction of said transverse groove at a height lower than the surface level of said projection and arranged to produce a narrow gap between the opposed adjacent buttresses or between the buttress and the opposite projection, said narrow gap being closed when the force acting on the tire exceeds a predetermined value.

4,217,943

LUG TIRE FOR AGRICULTURAL MACHINES

Junichi Tsuzura, Urawa, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 8, 1978, Ser. No. 967,755
Claims priority, application Japan, Dec. 28, 1977, 52/175630[U]
Int. Cl.² B60C *11/08*
U.S. Cl. 152—209 B **3 Claims**



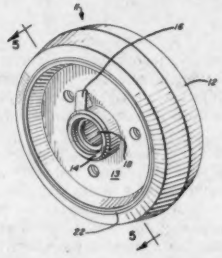
1. In a lug tire for agricultural machines comprising a tread portion, a pair of side portions extending radially and inwardly from both side edges of the tread portion, a pair of bead portions connected to both ends of the side portions a reinforcing carcass, and lugs arranged in herringbone pattern on the tread along the circumferential direction of the tire, said lugs spaced apart from each other by a distance which is at least 1.5 times larger than the surface width of the lug located at an outer side edge thereof, the improvement comprising said lugs comprise a center region having a width corresponding to 15% to 30% of the maximum width of said tread inclusive of said lug and extending in parallel with the tire axis and a pair of inclined side regions extending from both edges of said center region to outer edges of said lugs and inclined in a position adjacent to said center region at an angle α of at least 15° with respect to the tire axis.

4,217,944

MOLDED HEAVY DUTY WHEEL

Robert A. Pascal, 1350 Forest, Highland Park, Ill. 60035

Filed Oct. 25, 1977, Ser. No. 845,074
Int. Cl.² B60C *1/00*
U.S. Cl. 152—323 **7 Claims**



1. A wheel, having a body and a tread comprising, in combination,

a metallic core formed from a tube-like member and a dish-like insert having a central opening received within the interior of said tube-like member,

said metallic core having a circumferential bonding flange with an inside wall and an outside wall extending laterally a major portion of the tread width for bonding the tread to its outside wall,

a central molded material formed around the interior portion

of said metal core and interior to said bonding flange inside wall forming a body having an aperture at the center portion for the insertion of a bearing and related elements, said central molded material being selected from materials having good bonding, temperature, strength, and corrosion resisting properties,

a molded heavy duty tread bonded to the exterior portion outside wall of said circumferential flange, said molded tread being selected from materials having good resilient and wear properties and susceptible of a bonded relationship to said flange outside wall,

whereby a wheel is formed essentially of two moldable non-metallic type materials or combination thereof with a metal core for bonding the same as an interface.

4,217,945

WEDGE-SHAPED SECURING ELEMENT FOR ROLLER BLIND ASSEMBLY

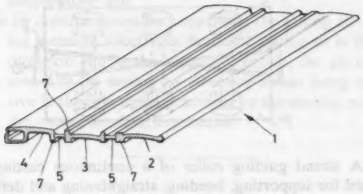
Gerd Stark, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Dyna-Plastik Werke GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,637

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801302

Int. Cl.[2] E06B *3/12, 9/00*

U.S. Cl. 160—236 **4 Claims**



1. In a wedge-element for connecting a roller blind assembly composed of section rods to a wind-up roll, the end of the element facing the roller blind assembly having a profile conformed to the profile of the sectional rods of the roller blind assembly, the improvement wherein said element is divided by a plurality of flexible portions defining a plurality of flexure points (5) into several members (2, 3, 4), there being present one less said flexible portion than said members, the initial member (2) of said several members being attachable to said wind-up roll (6) and being conformed to the circumferential shape of said wind-up roll (6).

4,217,946

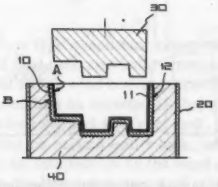
METHOD OF MAKING MOLDS

Taro Murahashi, and Yukuo Ogino, both of Osaka, Japan, assignors to Kokoku Steel Casting Company, Limited, Osaka, Japan

Filed May 29, 1979, Ser. No. 43,012

Int. Cl.[3] B22D *9/12*

U.S. Cl. 164—12 **6 Claims**



1. A method of making molds comprising the steps of preparing a facing sand material with a binder which will retain its plasticity for a long time, forming the material into a thin sheet of facing sand, cutting said sheet into pieces according to the shape of a pattern, applying said pieces to the surface of said pattern while joining them together along the junctions by the action of their plasticity to form a layer of facing sand which is continuous and uniform in thickness, charging backing sand for molding, and withdrawing the pattern.

4,217,947

PROCESS FOR THE DELIVERY OF MOLTEN METAL TO A CATERPILLAR TYPE MOLD

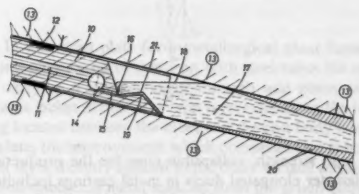
Ivan Gyöngyös, Männedorf, and Martin Bolliger, Sierre, both of Switzerland, assignors to Prolizenz AG, Chur, Switzerland

Filed Apr. 27, 1978, Ser. No. 900,753

Claims priority, application Switzerland, May 5, 1977, 5622/77

Int. Cl.[3] B22D *11/10, 11/06*

U.S. Cl. 164—87 **1 Claim**



1. A process for delivering molten metal into a caterpillar type mold for casting wide strips of non-ferromagnetic materials comprising:

inclining said caterpillar mold at an angle of from about 3° to 30° to the horizontal;

charging said mold with a head of liquid metal;

positioning a nozzle of fire-resistant material within said mold and proximate to said head of liquid metal so as to form a meniscus around said nozzle such that said molten metal is fed to said head of liquid metal under the free surface thereof whereby contact between said molten metal and the walls of said mold is delayed thereby reducing the initial rate of solidification of said molten metal; and

providing the nozzle with a raised portion downstream of the outlet of said nozzle for elevating said molten metal to the top of said head of liquid metal.

4,217,948

METHOD FOR PRODUCTION OF TWO-LAYER PIPE CASTING

Alexandr G. Merzhanov, ulitsa Tretya, 3, kv. 2; Alexandr R. Kachin, ulitsa Pervaya, 21, kv. 24; Vladimir I. Jukhvid, ulitsa Pervaya, 16, kv. 8; Inna P. Borovinskaya, ulitsa Tretya, 3, kv. 2, and Galina A. Vishnyakova, Institutsky prospekt, 11v, kv. 127, all of Moskovskaya oblast, Chernogolovka, U.S.S.R.

Filed Sep. 1, 1978, Ser. No. 939,107

Claims priority, application U.S.S.R., Aug. 29, 1977, 2511747

Int. Cl.[2] B22D *13/08;* B29C *5/04*

U.S. Cl. 164—115 **4 Claims**

1. A method for producing a two-layer pipe comprising the steps of filling a reaction chamber with an initial mixture comprising oxides of metals and reducing agents therefor in powdered form; causing said mixture to rotate about the longitudinal axis of said reaction chamber with a centrifugal acceleration of 300–1000 g., inflaming said mixture and then reducing the centrifugal acceleration at approximately a constant rate to 50–100 g. during the combustion time of the initial mixture and subsequent separation of the melt formed from the initial mixture into two layers, external and internal as a result of the

differences in the specific weights and maintaining it constant until crystallization of the two layers has been completed in order to obtain a two-layer pipe casting.

4,217,949

CORE FOR THE MAKING OF CASTINGS EQUIPPED WITH SLENDER DUCTS

Karl Wustrow, Konigsberger Str. 5, 3207 Borsum, Fed. Rep. of Germany

Filed Apr. 18, 1977, Ser. No. 788,368
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643525
Int. Cl.[2] B22C *9/10, 9/24*
U.S. Cl. 164—370 **7 Claims**

1. A high strength, collapsible core for the production of small diameter elongated ducts in metal castings including an outer tubular casing formed by side-by-side coils of a metallic wire, said wire being formed from a relatively hard and resilient metal; and an internal support structure mounted inside said tubular casing and formed for support of said tubular casing under molding pressures, said support structure being further formed for removal thereof from within said tubular casing after casting of said core into said metal casting and prior to removal of said tublar casing from said metal casting, wherein the improvement comprises:

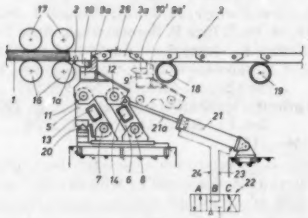
said internal support structure is formed as an axially extending central wire and an intermediate helically wound wire layer having a plurality of separate wires surrounding said central wire.

4,217,950

CONTINUOUS CASTING APPARATUS

Günter K. Pinkow, Düsseldorf, Fed. Rep. of Germany, assignor to Sack GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 1,847
Int. Cl.[3] B22D *11/08*
U.S. Cl. 164—426 **11 Claims**



1. Continuous casting apparatus, comprising:

opposing sets of rollers defining a guide path for a cast section emanating from a mould outlet;

a key-piece engageable with the leading end of the cast section, and arranged to be movable with said cast section when engaged therewith along said guide path in a direction away from said mould outlet; and

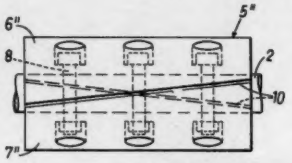
a key-piece detaching mechanism located at the end of said guide path, said mechanism including a detachment member mounted for entrainment by said key-piece as said key-piece moves along said guide path when engaged with said cast section, and said mechanism including means arranged to mechanically generate a force in response to said movement of said engaged cast section and key-piece, said means being further arranged so that said generated force is directed transversely of the cast section feed direction and acts upon said key-piece through said detachment member for detaching the key-piece from the cast section.

4,217,951

CONTINUOUS CASTING STRAND GUIDE ROLLER

Kurt Engel, Leonding, and Ronald Spannlang, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 5, 1977, Ser. No. 857,792
Claims priority, application Austria, Dec. 10, 1976, 9122/76
Int. Cl.[2] B22D *11/12;* B21B *31/08;* B65G *13/00*
U.S. Cl. 164—448 **6 Claims**



1. A strand guiding roller of a continuous casting plant adapted for supporting, bending, straightening and deforming a wide, continuously cast strand, said roller comprising:

an axle;

a plurality of roller bodies arranged on said axle, each one of said plurality of roller bodies being longitudinally divided into at least two segments along a plane that encloses an acute angle with the axis of the respective roller body, each one of said at least two segments surrounding said axle by 180° at the most; and

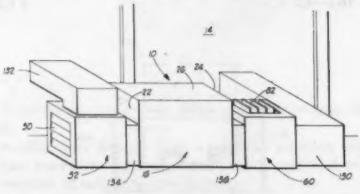
bracing means for holding said at least two segments on said axle.

4,217,952

ENERGY SAVING SYSTEM FOR RETRIEVING HEAT LOSS FROM AN ELECTRICAL APPARATUS

James V. Kelly, 2416 NW. 44th St., Oklahoma City, Okla. 73112

Filed Jul. 10, 1978, Ser. No. 922,961
Int. Cl.[3] B60H *1/00*
U.S. Cl. 165—39 **8 Claims**



1. An energy saving system for collecting and distributing the thermal energy loss of an electrical apparatus serving a building structure, the system comprising:

an apparatus compartment substantially enclosing the elec-

trical apparatus, the apparatus compartment having an air inlet port and an air exiting port;

blower means for blowing air into the air inlet port of the apparatus compartment in heat absorbing relationship with the electrical apparatus, the air exiting the apparatus compartment through the air exiting port thereof;

inlet air directing means for directing suction air to the blower means selectively from a first air source and from a second air source, the inlet air directing means comprising:

a sensing means for sensing the temperature of the air exiting from the air exiting port of the apparatus compartment, the sensing means providing a signal proportional to the sensed temperature; and

an air control means for controlling the inlet air directing means to selectively draw air from the second air source, the air control means being responsive to the signal generated by the sensing means; and

exiting air directing means receiving air from the air exiting port of the apparatus compartment, the exiting air directing means selectively directing the air in a first direction and in a second direction, the exiting air directing means comprising:

a sensing means for sensing a selected system temperature, the sensing means of the exiting air directing means providing a signal proportional to the sensed system temperature; and

an air control means for controlling the exiting air directing means to selectively direct the exiting air in the first direction and in the second direction, the air control means of the exiting air directing means being responsive to the first signal generated by the sensing means of the exiting air directing means.

4,217,953
PARALLEL FLOW TYPE EVAPORATOR

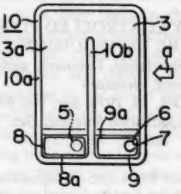
Noriaki Sonoda, and Kiyoshi Koike, both of Tokyo, Japan, assignors to Nihon Radiator Co., Ltd. (Nihon Rajiecta Kabushiki Kaisha), Tokyo, Japan

Division of Ser. No. 773,237, Mar. 1, 1977, Pat. No. 4,153,106. This application Sep. 21, 1978, Ser. No. 944,428

Claims priority, application Japan, Mar. 9, 1976, 51-27005; May 11, 1976, 51-58392

Int. Cl.[2] F28D *1/04*; F28F *9/22*

U.S. Cl. 165—44 **4 Claims**



1. A parallel flow type evaporator comprising a first outlet tank and a second inlet tank, said tanks arranged in side-by-side fashion before and after a wind course, respectively, a plurality of flat pipes formed into an inverted U-shape communicating between said outlet tank and said inlet tank, fins inserted between adjacent flat pipes, said outlet tank, said flat pipes and said fins disposed for intersection by the wind course, an outlet pipe inserted into the innermost regions of said outlet tank and an inlet pipe communicating with said inlet tank, said outlet pipe provided with a plurality of bores adjacent said flat pipes communicating between said outlet and said inlet tanks.

4,217,954
COOLING PLATE FOR A FURNACE IN A METALLURGICAL PLANT

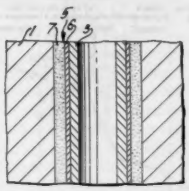
August Vincent, Oberhausen, Fed. Rep. of Germany, assignor to Gutehoffnungshütte Sterkrade Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jan. 29, 1979, Ser. No. 7,605

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804544

Int. Cl.[2] F28F *19/06, 7/02*; C21B *7/10*

U.S. Cl. 165—133 **7 Claims**



1. In a cooling plate for a metallurgical plant furnace, said cooling plate being of cast iron with steel tubes for receiving and carrying a cooling agent through said plate, said tubes having a jacket of one or several layers sheathing the tubes and being located between the tubes and the cast body of the cooling plate, the improvement which comprises said tubes having a first layer directly applied to the outer surface of said tube of carbide-stabilizing metal selected from the group consisting of Cr, Mo, V, W, Ti, Zr, Nb, Ta and alloys of one or more of said metals, and a second layer deposited thereon of a thermally resistant metal oxide, a mixture of metal oxides and a metal alloy or another metal.

4,217,955
OIL RECOVERY PROCESS

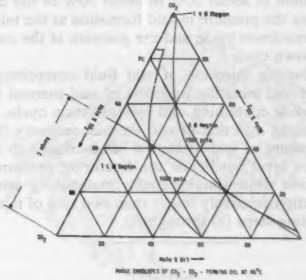
Phillip M. Sigmund, Bragg Creek; Jong I. Lee, Calgary, and James E. Fosti, Calgary, all of Canada, assignors to Petroleum Recovery Institute, Calgary, Canada

Filed Jan. 25, 1979, Ser. No. 6,809

Claims priority, application Canada, May 15, 1978, 303344

Int. Cl.[3] E21B *43/22*

U.S. Cl. 166—252 **7 Claims**

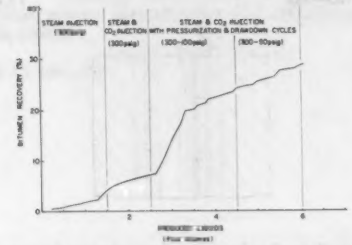


1. A method for improving the recovery of oil from a subterranean hydrocarbon-bearing reservoir by the injection of sulfur dioxide and carbon dioxide gases which are individually immiscible with the oil at the prevailing reservoir conditions of temperature and pressure comprising injecting into said reservoir a mixture of sulfur dioxide and carbon dioxide in a ratio at which said mixture is directly miscible with the oil in the reservoir at said conditions.

4,217,956
METHOD OF IN-SITU RECOVERY OF VISCOUS OILS OR BITUMEN UTILIZING A THERMAL RECOVERY FLUID AND CARBON DIOXIDE

Michael J. Goss, and Douglas I. Exall, both of Sherwood Park, Canada, assignors to Texaco Canada Inc., Calgary, Canada

Filed Sep. 14, 1978, Ser. No. 942,244
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 **13 Claims**



1. In a method for the recovery of viscous oil or bitumen from a subterranean oil-bearing formation traversed by at least one injection well and one production well said formation being at an initial formation pressure wherein a thermal recovery fluid is injected via said injection well and formation fluids are produced via said production well, the improvement comprising:

(a) decreasing the rate of injection of said thermal recovery fluid relative to the rate of production of said formation fluids when production of oil or bitumen has reached an undesirable low level thereby initiating a drawdown cycle of said formation,

(b) maintaining said rate of injection lower than said rate of production thereby continuing said drawdown cycle until the pressure in said formation has declined to a value no more than 50% of said pressure at the initiation of said drawdown cycle,

(c) terminating injection of said thermal recovery fluid and initiating injection via said injection well of a fluid comprising carbon dioxide while simultaneously decreasing said rate of production relative to said rate of injection thereby undertaking a pressurization cycle of said formation,

(d) continuing injection of said fluid comprising carbon dioxide until the pressure of said formation has increased an amount of about 20% to about 50% of the difference between the pressure in said formation at the initiation of said drawdown cycle and the pressure at the end of said drawdown cycle,

(e) terminating injection of said fluid comprising carbon dioxide and initiating injection of said thermal recovery fluid while continuing said pressurization cycle,

(f) continuing injection of said thermal recovery fluid until the pressure of said formation has increased to a desired pressure level but below the fracturing pressure of said formation while simultaneously maintaining said rate of production relatively lower than said rate of injection,

(g) repeating steps (a) through (f).

4,217,957
OIL RECOVERY METHOD

Vernon H. Schievelbein, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,199
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—273 **10 Claims**

1. A process for recovering petroleum from an underground reservoir wherein the reservoir is penetrated by at least one injection well and at least one production well, said wells being in fluid communication with each other, and wherein the reservoir contains a brine with a salinity of up to about 220 kg/m^3 comprising:

a. injecting into the reservoir an effective amount of an aqueous surfactant-containing fluid which comprises a mixture of two chemicals, A and B, wherein A is characterized by the formula

$$R_A(OCH_2CH_2)_mR'SO_3X$$

where m is a number from 1 to 6, X is a cation, R' is ethylene, propylene or hydroxy propylene, and R_A is an alkyl benzene radical containing from 8 to 15 carbon atoms in the alkyl group, and wherein B is characterized by the formula

$$R_B(OCH_2CH_2)_mR'SO_3X$$

where m, R' and X have the same meaning as in A and R_B is a dialkyl benzene radical containing within each alkyl group a number of carbon atoms that is from 2 less than to 2 more than, that found in the single alkyl chain of A, wherein the mole ratio of B to A is from about 0.11 to about 0.25,

b. forcing the surfactant containing fluid through the reservoir, and

c. recovering petroleum from the reservoir.

4,217,958
SACRIFICIAL AGENTS FOR PETROLEUM RECOVERY PROCESSES

Martha S. Doster, and Mohan V. Kudchadker, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 24, 1978, Ser. No. 963,642
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 **9 Claims**

1. In a method for recovering oil from a subterranean oil reservoir penetrated by at least one injection means and at least one production means said injection and production means being in fluid communication with each other wherein an aqueous surfactant-containing fluid and an alkyl aryl alkoxylated sulfonate, is injected into the reservoir in order to mobilize and drive the oil to the production means wherefrom it is produced, the improvement which comprises:

injecting into the reservoir first alone and then in admixture with the aqueous surfactant-containing fluid a sacrificial agent selected from the group consisting of maleic acid, succinic acid, oxalic acid, malonic acid, glutaric acid, their water soluble salts and mixtures thereof wherein the sacrificial agent is present in an amount effective to reduce the extent of the adsorption of the surfactant onto the mineral grains of the reservoir rock matrices.

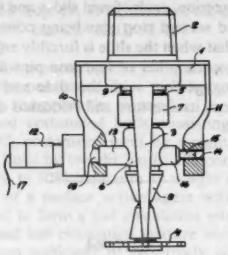
4,217,959
ELECTRICALLY CONTROLLED FLUID DISPERSER FOR A FIRE EXTINGUISHING SYSTEM

Soren B. Poulsen, Skovlunde, Denmark, assignor to GW-Sprinkler A/S, Skodsborg, Denmark

Filed Oct. 18, 1978, Ser. No. 952,596
Claims priority, application Sweden, Oct. 20, 1977, 7711811
Int. Cl.[2] A62C *37/18*
U.S. Cl. 169—28 **7 Claims**

1. A fluid disperser for a fire extinguishing system, the disperser having a body part with an outlet orifice for extinguishant, a frangible safety device closing said orifice, said safety device being secured between the orifice and a baffle plate disposed in alignment with said orifice and retained by two retainers secured to the body part, an electrically controlled striking mechanism for momentary fracturing the safety device being disposed adjacent the safety device in a first holder outside the path of the extinguishant, and wherein a striking pin is slidably inserted in said first holder between the striking mechanism and the safety device and abuts said safety device, said pin being inserted in said first holder in such manner that said pin falls out of said first holder upon fracturing of said safety device, whereas a second holder is disposed outside the

path of the extinguishant diametrically opposite the said first holder relatively to the safety device, and a counter-rest being



held in abutment with the safety device by means of a screw which is secured into said second holder.

4,217,960

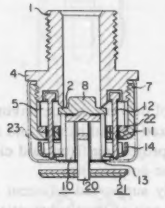
FLUSH PENDANT SPRINKLER HEAD HAVING RELATIVELY SLIDABLE DEFLECTOR AND PLUG BODY

Tashirou Miyazaki, Menuma, Japan, assignor to Nohmi Bosai Kogyo Co., Ltd., Japan

Filed Dec. 4, 1978, Ser. No. 965,788

Int. Cl.³ A62C *37/08*

U.S. Cl. 169—38 **6 Claims**



1. An automatic sprinkler of the flush type wherein a discharge orifice formed axially in a sprinkler body is adapted to be sealingly closed by a plug body in the assembled state through lever means supported in said sprinkler body in association with a soldered link, characterized in that a deflector means is arranged outside and directly below a cylindrical frame which is connected to the lower end of said sprinkler body and said deflector means is secured to guide bars which are shiftably mounted to said sprinkler body, wherein in the moved state said plug body moves to open said orifice and said deflector means drops below said discharge orifice at a distance determined by the length of said guide bars to uniformly distribute the water discharged through said discharge orifice, and wherein said plug body has generally cylindrical form with a head part to close said discharge orifice and a depending cylindrical part provided with a number of pairs of vertical slots disposed diametrically, all or some of the lower end portions of said depending cylindrical part being bent outward, said cylindrical frame having a central opening in the bottom to allow the free fall of said plug body when it moves to open said orifice, and a corresponding number of small holes to shiftably receive said guide bars, said deflector means resting on said bent lower end portions of said depending cylindrical part of said plug body in the assembled state.

4,217,961

WATER SPRINKLERS

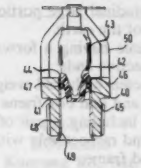
John Wotton, Weybridge, England, assignor to Angus Fire Armour Limited, London, England

Filed Mar. 28, 1978, Ser. No. 891,141

Claims priority, application United Kingdom, Apr. 2, 1977, 14003/77

Int. Cl.² A62C *37/14*

U.S. Cl. 169—41 **17 Claims**



1. A sprinkler comprising a support body, a fluid passage extending through said support body, a substantially tubular shaped closure member having a recess at one end and a radially outer frusto-conical sealing surface which has a substantially radially outwardly extending shoulder adjacent to said recessed end and tapers inwardly in a direction away from said recessed end and extends in the direction of flow of fluid through said fluid passage to effect a fluid-tight seal in said fluid passage, a temperature sensitive element seated in said recess and acting between said support body and said closure member, sealing means located in said fluid passage and bearing against said sealing surface, said closure member being shaped so that its maximum diameter is less than the minimum diameter of said fluid passage and positioned to be free to move in an axially inwards and in an axially outwards direction relative to said fluid passage and maintain said fluid-tight seal during relative movement between said temperature sensitive element and said fluid passage under normal operation conditions.

4,217,962

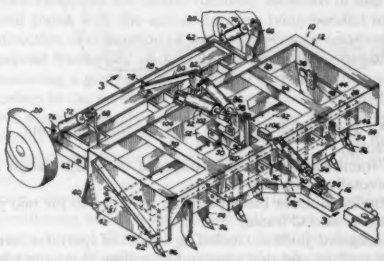
HYDRAULICALLY OPERATED GRADE SCRAPER

Michael J. Schaefer, Okarche, Okla. 73762

Filed Oct. 5, 1978, Ser. No. 948,934

Int. Cl.² E02F *3/64*

U.S. Cl. 172—197 **2 Claims**



1. A drag scraper comprising:

a box frame adapted to be drawn by a prime mover having a hydraulic fluid supply system,

said box frame extending transversely of the direction of travel and having vertical end walls joined by a rear wall defining an open bottom and a forwardly open side;

a beam extending between the upper limit of said end walls at the forward side of said box frame;

a forwardly projecting drawbar pivotally connected at its rearward end with said beam;

an elongated longitudinally adjustable drawbar lift member extending between and connected with said beam and said drawbar intermediate their ends;

a scraper blade longitudinally secured to the depending portion of said rear wall and adapted to scrape soil against the forward side thereof on forward movement;

a generally rectangular weighted frame pivotally connected by one longitudinal edge portion to the rearward surface of said box frame rear wall for vertical pivoting movement of its other longitudinal edge portion toward and away from the surface of the earth,

said weighted frame having a forward upstanding standard at its respective ends;

wheel means connected with said weighted frame for supporting the latter and said box frame in a mobile manner,

said wheel means including, a pair of arms pivotally connected at one end respectively with the respective end of said weighted frame,

a pair of stub axles connected respectively with the other end of said pair of arms,

a pair of wheels journalled by said stub axles, and,

an elongated longitudinally adjustable wheel lift member extending between and connecting said other end of said pair of arms with the respective said standard for raising and lowering the respective end portion of said weighted frame in a tilting action; and,

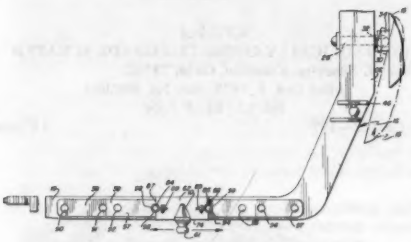
means including a hydraulic cylinder pivotally connecting said weighted frame other edge portion with said box frame for raising and lowering said box frame in a forward and rearward tilting action toward and away from the surface of the earth.

4,217,963

BULLDOZER BLADE ANGLE SLIDE MECHANISM

Gary P. Freese, Joliet, and James A. Olthoff, South Holland, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 12, 1977, Ser. No. 859,771
Int. Cl.[3] E02F *3/76*
U.S. Cl. 172—804 **7 Claims**



5. An angle bulldozer blade for a tractor comprising:

a tractor;

a C-frame having side arms disposed about the tractor and pivotally connected thereto;

an angle bulldozer blade pivotally mounted to the mid portion of said C-frame;

an elongated guide rail including a series of apertures carried by each of said side arms and extending along the same;

a pair of slides, one for each rail, slidably mounted on the corresponding rail;

thrust members interconnecting each of said slides and said blade;

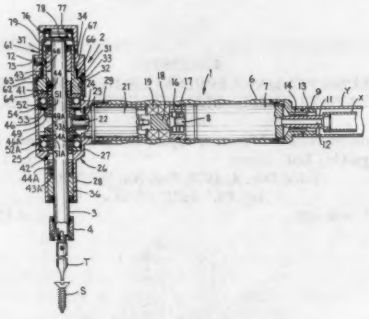
first and second stop pins removably received in the apertures in each of said rails in locations spaced from each other, each first stop pin being receivable in an aperture in the corresponding rail for allowing slide movement in one direction on the corresponding rail while precluding movement in the opposite direction, each second stop in being receivable pin another aperture in the corresponding rail for precluding movement of said slide in said one direction while allowing movement of said slide in said opposite direction, each of said slides and the corresponding first and second stop pins being constructed and arranged so that when the slide is forcibly engaged with one of said stops, the other of said stop pins is not subject to force by engagement with the slide and may be easily removed from its aperture and relocated on said rail, and vice versa.

4,217,964

FORWARD AND REVERSE ROTARY TOOL

Russell K. Eaton, Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Jan. 2, 1979, Ser. No. 525
Int. Cl.[2] E21B *3/00, 1/00*
U.S. Cl. 173—163 **9 Claims**



1. In a rotary tool driving device having a handle, a clutch and gear housing fixed to said handle and a power output shaft axially within and projecting from said clutch and gear housing, the combination comprising:

a pinion rotatably supported adjacent said shaft and positioned with its axis at least substantially perpendicular to the axis of said shaft and means including prime mover means within said handle for driving said pinion;

a pair of clutch means each having driving and driven elements thereof and including connecting means drivingly connecting said elements of each of said pair of clutch means,

the driving element of each of said pair of clutch means being in permanent mesh with said pinion and supported on, and for rotation with respect to, said shaft and means restraining each of said driving elements from axial movement with respect to said housing, and

each of said driven elements being fixed to said shaft and spaced thereon a distance greater than the spacing of the respectively adjacent connecting means on said driving elements;

said shaft being axially slidable in said housing and with respect to said driving elements whereby in one axial position thereof one of said driven elements will drivingly engage its corresponding driving element for effecting rotation of said shaft in one direction and in another axial position of said shaft the other driven element will engage in driving relationship its corresponding driving element for effecting rotation of said shaft in the opposite direction; and manually operable means for holding said shaft in a selected one of said axial positions.

4,217,965

METHOD FOR PREVENTING FLUID LOSS DURING DRILLING

Jim G. Cremeans, 3800 Planz Rd., Bakersfield, Calif. 93309

Filed Aug. 21, 1979, Ser. No. 68,408
Int. Cl.³ E21B *33/138*
U.S. Cl. 175—72 **12 Claims**

1. A method for preventing loss of aqueous drilling fluid to porous formations penetrated by a well bore during drilling operation which comprises the steps of:

mixing pelleted cottonseed hulls consisting essentially of 40% to 60% cottonseed meal by weight, 20% to 40% cottonseed hulls by weight, up to 3% cottonseed lint by weight, 10% to 30% bentonite by weight and up to 1.0% by weight of a surface active agent with said aqueous drilling fluid to form a lost circulation mixture; and

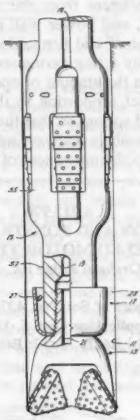
introducing said lost circulation mixture into said well bore in an amount sufficient to effectively seal said porous formations penetrated by said well bore.

4,217,966

JUNK BASKET, BIT AND REAMER STABILIZER

William R. Garrett, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jan. 26, 1978, Ser. No. 872,729
Int. Cl.² E21B *27/00*
U.S. Cl. 175—308 **11 Claims**



11. Subject matter useful for earth boring by the rotary method comprising:

a junk basket cup,

said cup being made of steel having a hardness in the range of 200–350 Brinwell and a tensile strength in the range of 100,000 to 150,000 pounds per square inch, and including an upstanding side wall terminating in a rim and a circularly apertured bottom having an inner edge whose upper and lower surfaces are plane and parallel,

said bottom and side wall being connected by an imperforate rounded portion whose inner and outer surfaces are quatrotoroidal,

the inner and outer surfaces of said side wall being imperforate and flaring upwardly,

said apertured bottom having but a single aperture therethrough, the cup being otherwise imperforate,

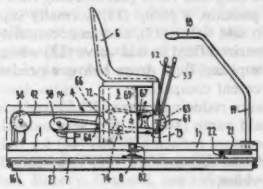
whereby when said cup is positioned with the pin of a rotary drill bit extending through said aperture drilling fluid will be prevented from flowing up through the cup and will be wholly diverted to flow past said bottom and rounded portion and outside of said side wall up to said rim with the horizontal crosssection of the annulus flow space between the exterior of the cup and the earth bore thereabout made by such bit decreasing progressing upwardly to increase the velocity of flow of drilling fluid from the bit flowing upwardly around the cup, until at said rim the crosssection of said flow space suddenly increases to reduce the velocity of such fluid and allow detritus carried upwardly from below the cup by such drilling fluid to fall back into said cup.

4,217,967

ROLLERS

Ronald S. Kaye, 112 Kunyung Rd., Mt. Eliza, 3930 Victoria, Australia

Filed Mar. 1, 1978, Ser. No. 882,359
Claims priority, application Australia, Mar. 3, 1977, PC9263
Int. Cl.² B60D *57/00*
U.S. Cl. 180—20 **6 Claims**



1. A roller apparatus for compacting and smoothing a grassy surface by movement along a line of travel, said apparatus having a predetermined width parallel to the line of travel which is small compared to its length for permitting the apparatus to be moved through narrow openings, said apparatus comprising:

a first, elongated frame;

parallel, closely spaced, elongated first and second roll means mounted in said first frame with the axes of rotation lying parallel to the direction of elongation of said first frame;

a second elongated frame;

a third elongated roll means rotatably mounted in said second frame with the axis of rotation lying parallel to the direction of elongation of said second frame, said first and second frames and associated roll means being capable of assuming a generally horizontal orientation during application to the surface to be compacted and smoothed;

drive means drivingly connected to at least one of said roll means for propelling said roller apparatus in the line of travel generally normal to the axis of said third roll means; and

means coupling said first and second frames together for positioning said first and second roll means in close proximity to said third roll means to form the small width dimension of said roller apparatus and concentrate its compacting and smoothing weight, said coupling means providing pivoting of said first frame with respect to said second frame about a generally vertical axis for steering said roller apparatus, said coupling preventing pivoting of said first frame with respect to said second frame about a horizontal axis normal to the line of travel of said roller;

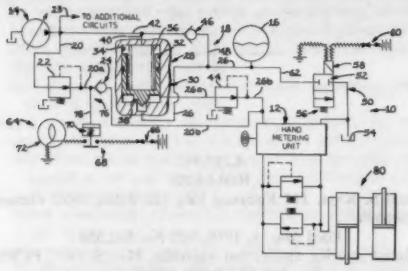
said roller means being so mounted in said frames as to be restrained against movement with respect to said frames other than rotation about their axes.

4,217,968

CLOSED CENTER EMERGENCY STEERING WITH ACCUMULATOR SOURCE

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 4, 1978, Ser. No. 948,370
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—133 **6 Claims**



1. In an emergency system (10) for a vehicle having a closed center valve (12), said valve (12) blocking flow thereat when in the closed position, a pump (14) normally supplying pressurized fluid to said valve (12), and an accumulator (16) for supplying pressurized fluid to said valve (12) when the pressure of said pump supplied fluid drops below a predetermined value, the improvement comprising:

first pressure reducing means (22) for reducing the pressure from said pump (14) to a first selected value;

second pressure reducing means (44) for reducing the pressure of said accumulator (16) to a second and lower selected value;

means (26,42,46) for communicating flow from said pump (14) towards said accumulator (16) and preventing reverse flow; and

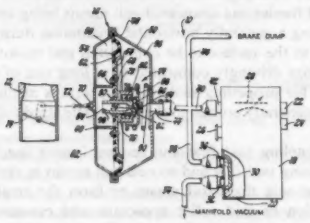
means (28) for blocking flow from said accumulator to said valve (12) in response to the pressure of said pump supplied fluid being above said predetermined value.

4,217,969

POSITION FEEDBACK VALVE ASSEMBLY AND SERVO MOTOR INCORPORATING SAME

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 15, 1978, Ser. No. 969,699
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—175 **2 Claims**



1. A vehicle road speed servomotor adapted to control a vehicle engine throttle mechanism and thus control vehicle speed when the servomotor is power operated, said servomotor comprising: a housing having a fixed wall and movable power wall defining therewith a variable pressure chamber on one power wall side and a constant pressure chamber on the other power wall side so that a pressure differential may be selectively established across said power wall to power operate said servomotor, said power wall being adapted to control a vehicle engine throttle mechanism and thus control vehicle road speed when said servomotor is power operated; power wall return spring means operatively positioned between and acting on said power wall and said housing and continually urging said power wall in a direction tending to close the engine throttle; a valve assembly including

a first valve member having a fluid flow passage therethrough opening into said variable pressure chamber,

a second valve member movable relative to and cooperable with said first valve member to vary the effective opening of said fluid flow passage and effectively control fluid flow therethrough within a predetermined fluid flow range,

a spring seat having one of said valve members thereon and movable to move said one valve member relative to the other of said valve members,

a first spring having one end acting on said spring seat and the other end acting on one of said walls and being loaded in compression to act through said spring seat and urge said one of said valve members in a direction tending to close said fluid flow passage,

and a second spring acting on said spring seat and controlling the urging of said one of said valve members in a direction tending to open said fluid flow passage,

one of said first and second springs also operatively acting on said power wall and having a spring rate which is substantially different from the other of said first and second springs, said power wall return spring means including said one of said first and second springs;

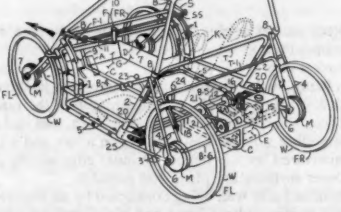
said valve assembly acting during servomotor power operation to maintain the amount of opening of said fluid flow passage in direct proportion to the compression of said first and second springs so that the movement of said one of said valve members is always substantially less than and in proportion to the movement of said power wall.

4,217,970

CONFIGURATION AND CONSTRUCTION OF FOUR WHEELED MOTOR VEHICLES

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 437,482, Jan. 28, 1974, abandoned. This application Dec. 5, 1977, Ser. No. 857,568
Int. Cl.[2] B62D *21/12*; B60K *17/00*
U.S. Cl. 180—298 **65 Claims**



1. A four-wheeled motor vehicle constructed from two exclusively configured left and right longitudinal side-structures operatively interconnected by plural, transversely positioned connecting and bracing members;

each side structure operatively supporting a front wheel adapted for steering and a rear wheel adapted for driving;

each bracing member comprising a longer mid-portion and two shorter end-portions; each longer mid-portion positioned substantially horizontally and transversely between said side-structures; each shorter end-portion positioned substantially at a right angle to said mid-portion and oper-

atively secured to correspondingly located rigid portions of said side-structures at plural points along said rigid portions;

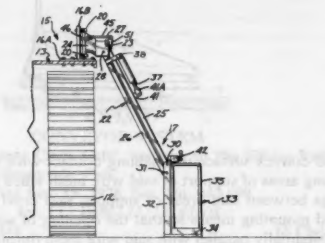
said longer mid-portions supporting a floor and seats of said vehicle, a steering system operatively coupling the front wheels of said side-structures, a propulsion means adapted to drive at least one rear wheel of said vehicle, controlling means to efficiently operate said vehicle from the seat of its operator.

4,217,971

ROTATING POWERED STEP

Theodore Rivinius, 810 N. Second St., Bismarck, N. Dak. 58501

Filed Feb. 16, 1979, Ser. No. 12,956
Int. Cl.[2] B60R *3/02*
U.S. Cl. 182—2 **7 Claims**



1. A powered step for large vehicles comprising a support member adapted to be mounted onto a vehicle, a mounting bracket mounted with respect to said support member about an upright pivot axis, parallel link means mounted at first ends thereof to said mounting frame about first generally horizontal pivot axes, and an operator support pivotally mounted to second ends of said parallel link means about second axes generally parallel to the first pivot axes, power means coupled to move said parallel link means to raise the operator's support from a first lowered position adjacent the ground to an upper lifted position spaced from the ground, and an actuator link pivotally mounted at one end to one of said parallel link means at position offset from both of the first pivot axes and pivotally mounted at a second end to said support member at a position laterally offset from the upright pivot axis to thereby cause a moment tending to rotate said mounting bracket about said upright pivot axis as the parallel link means are moved about their pivot axes.

4,217,972

NON-METALLIC HYDRAULIC LIFT CASING

Raymond E. Jones, Lexington, Ky., assignor to Dura Corporation, Southfield, Mich.

Filed Jun. 7, 1978, Ser. No. 913,468
Int. Cl.[2] B60S *13/00*
U.S. Cl. 187—8.41 **6 Claims**

1. In a hydraulic lift of the type comprising:

a cylindrical casing and plunger assembly,

a superstructure on top of said plunger,

fluid pressure means for admitting fluid under pressure to said cylindrical casing and plunger assembly for raising and lowering a plunger relative to said cylindrical casing, and

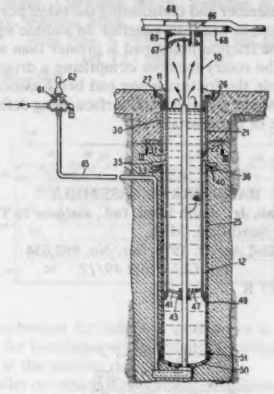
control means for said fluid pressure means, wherein the improvement comprises:

a multi-part casing forming said cylindrical casing in which said plunger is reciprocated,

said multi-part casing having an upper non-deformable metallic casing part forming a guide for the plunger and having bearing means taking the lateral stresses on the plunger,

and a lower non-metallic casing part comprising a relatively inert fiberglass composite having a polyvinyl chloride core wrapped by fiberglass filaments encased in corrosion-resistant epoxy resin,

and coupling means joining said upper and lower parts so



that said lower part forms a downward continuation of said metallic casing part and extends into the ground into a region subject to electrolysis and corrosion,

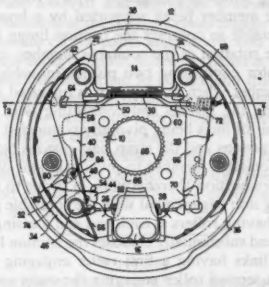
and means for locking said parts in aligned relation with respect to each other.

4,217,973

WEAR INDICATING DEVICE FOR A FRICTION BRAKE

Christopher Johns, Rubery, England, and Gérard Le Deit, Aulnay Sous Bois, France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Dec. 11, 1978, Ser. No. 968,606
Int. Cl.[2] F16D *66/02*
U.S. Cl. 188—1 A **5 Claims**



1. A friction brake comprising operating means capable of urging at least one friction lining pad into braking contact with a rotary member in order to slow down the rotation of the latter, adjusting means being provided to modify automatically the position occupied by the friction lining pad in the absence of operation of the operating means according to the wear on the pad, said adjusting means comprising at least one movable member responsive to wear of the friction lining pad so as to move relative to the rotary member, and a device being provided to detect wear on the friction lining pad, said detecting device being operated by the movement of the movable member relative to the rotary member and comprising at least two portions normally spaced from one another when the wear on the friction lining pad is less than a predetermined value, the establishment of contact between the said portions giving rise

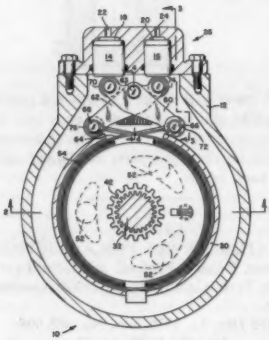
to a warning signal, one of the said portions being associated with the movable member, the other being associated with the rotary member, the portion of the detecting device associated with the movable member comprising at least one flexible blade capable of engaging a rough cylindrical surface defined on the rotary member and constituting the other portion of the detecting device, in order to generate an audible signal when the wear on the friction lining pad is greater than a predetermined value, the rotary member comprising a drum mounted on a central hub, the friction lining pad being associated with a brake shoe, the rough cylindrical surface being defined by the outside surface of the central hub.

4,217,974

BAND BRAKE ASSEMBLY

Orla L. Holcomb, Jr., South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 3, 1978, Ser. No. 892,634
Int. Cl.[2] F16D *49/12*
U.S. Cl. 188—77 R **1 Claim**



1. In a band brake assembly having a strap supporting a friction lining which is engageable with a rotatable member, the rotatable member being supported by a housing, and an actuator operable to contract the friction lining to a position retarding the rotation of the rotatable member, characterized by the actuator comprising two pistons movable toward the rotatable member when the actuator is operated and a pair of links engaging the pistons and connecting with ends of the strap, said pair of links being pivotally connected at a position between the pistons and the strap, said pistons being movable toward the rotatable member to pivot said pair of links about the pivotal connection therebetween in order to contract the friction lining into engagement with the rotatable member, the pair of links having rollers at each end and a casing attaches to the housing and substantially encloses the friction lining, one of said pair of links having a first roller engaging one of said pistons and a second roller engaging the outer surface of the casing, and the other link having a first roller engaging the other of said pistons and a second roller engaging the outer surface of the casing.

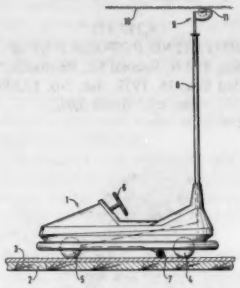
4,217,975

CURRENT COLLECTOR FOR AMUSEMENT PARK BUMPER CARS

Ludwig Barth, Kreuznacherstr 29, 6555 Sprendlingen, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 877,842
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706724
Int. Cl.[2] B60M *1/00*
U.S. Cl. 191—13 **3 Claims**

1. A current collector arrangement for an amusement park bumper car, comprising: a wire mesh stretched overhead above said bumper car; a collector tube for collecting current from said wire mesh; a floor with metal panels to which current to conducted from said wire mesh; roller means at substantially small distance from said collector tube for collecting current from said wire mesh; freely rotating spring-supported mounting means for mounting said roller means; said roller means having a convex-turned surface; and a bowl for enclosing a major portion of said roller means; said roller means with



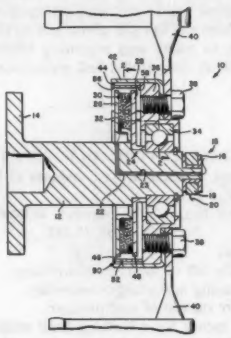
said convex surface maintaining contact with said wire mesh along areas of support of said wire mesh when said wire mesh sags between said areas of support, said bowl being fixed to said mounting means so that the opening of said bowl is held substantially parallel with said wire mesh during movement of said collector tube with said bumper car; said mounting means comprising further a rod sliding in said current collector tube; two relatively short arms in the end region of said rod and attached at right angles for holding an axle of said roller means.

4,217,976

ELECTROMAGNETIC BAND CLUTCH

Allen W. DeJong, Chatham, Canada, assignor to Canadian Fram Ltd., Chatham, Canada

Filed Apr. 28, 1978, Ser. No. 900,829
Int. Cl.[2] F16D *27/02, 13/10*
U.S. Cl. 192—84 T **9 Claims**



1. In a clutch, a pair of coaxial relatively rotatable members comprising a driving member and a driven member, one of said members including an axially extending portion, the other member having an outer circumferential surface cooperating with said axially extending portion to define a circumferentially extending gap therebetween, a circumferentially extending band located in said gap, means drivingly engaging one end of said band to said one member, said band extending circumferentially from said one end in the direction of rotation of said driving member, actuating means for forcing said band into

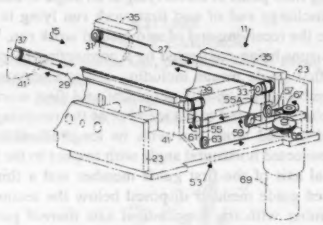
driving engagement with said outer circumferential surface of said other member when the clutch is engaged, said actuating means including electromagnetic means carried by said other member and rotatable therewith, a slip ring mounted on the end of said other member, connecting wires connecting said slip ring with said electromagnetic means and connecting said slip ring with a source of electrical current, and bearing means carried by said other member and axially separated from said slip ring for mounting said one member for rotation relative to the other member, said other member including a pair of axially spaced, radially extending sections terminating in circumferentially extending outer edges, said outer edges defining said outer circumferential surface of said other member, said bearing means being located axially between said slip ring and said sections.

4,217,977

CONVEYOR SYSTEM

Johann Tam, Santa Clara, Calif., assignor to The Silicon Valley Group, Inc., Sunnyvale, Calif.

Filed Sep. 15, 1978, Ser. No. 942,608
Int. Cl.[3] B65G *15/12, 43/08*
U.S. Cl. 198—341 **13 Claims**



1. A conveyor system of the kind in which the lateral spacing between two conveyor belts is varied during different periods of operation of the conveyor system, said conveyor system comprising,

a frame,

first and second carriages mounted on said frame in parallel with each other and moveable laterally toward and away from each other,

carriage shift means for selectively moving each carriage laterally in an amount equal to and in a direction opposite to the movement of the other carriage,

a conveyor belt on each carriage having an upper surface engagable with the underside of the objects for both supporting and carrying the objects longitudinally along the carriage,

a conveyor belt drive pulley mounted for rotation on each carriage about a horizontal axis and engaged with the conveyor belt to drive the conveyor belt,

first and second idler pulleys mounted for rotation on each carriage about horizontal axes orthogonal to said horizontal of axis of rotation of the conveyor belt drive pulley,

a drive pulley and an idler pulley mounted for rotation on the frame, and

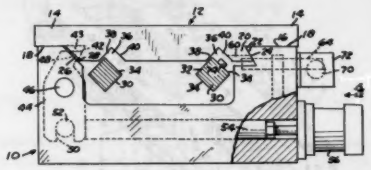
drive belt means including a flexible, closed loop, fixed length drive belt operatively looped over each of the pulleys for driving both conveyor belts at all lateral positions the carriages on the frame without change in the length of the drive belt.

4,217,978

PRECISE PALLET LOCATING AND CLAMPING ARRANGEMENT FOR WORKPIECE TRANSFER MECHANISM

Neil J. Stalker, Clarkston, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Nov. 3, 1978, Ser. No. 957,482
Int. Cl.[2] B65G *25/02*
U.S. Cl. 198—345 **14 Claims**



1. A mechanism for indexing workpieces to successive stations and for locating and clamping the workpieces at precise locations at the stations comprising:

(a) a pallet on which the workpiece is adapted to be fixedly mounted and having a pair of laterally spaced, downwardly facing, flat locating surfaces thereon;

(b) a fixture at each station having a pair of upwardly facing flat locating surfaces thereon adapted to be vertically abutted by the locating surfaces on the pallet to support and locate the pallet in a precise horizontal plane;

(c) a pair of laterally spaced transfer bars extending longitudinally through the successive stations;

(d) means for raising and lowering the transfer bars to lift and lower the pallet;

(e) means for reciprocating the transfer bars longitudinally for advancing the pallet through successive stations;

(f) said pallet and fixture having inclined, interengageable surface means thereon;

(g) clamp means on the fixture engageable with the pallet for shifting the pallet laterally in one direction after the transfer bars are lowered and the pallet is deposited on the locating surfaces of the fixture to interengage said inclined surface means on the pallet and fixture, said inclined surface means being adapted, when the pallet is shifted laterally in said one direction, to engage and draw the pallet downwardly against the fixture so as to bring the locating surfaces on the pallet into firm coplanar relation with the locating surfaces on the fixture;

(h) said transfer bars and pallet having means thereon interengageable when the transfer bars are raised to lift the pallet and displace it laterally in a direction opposite to said one direction.

4,217,979

PRODUCTION OF BLOCKS OF ROD-SHAPED ARTICLES

Hubert Bald, Gevelsberg, and Joachim Zeitel, Hagen, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

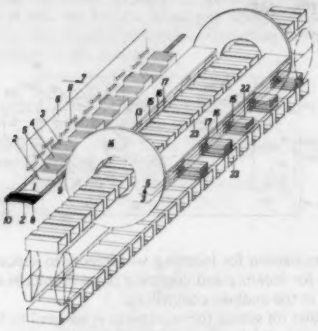
Filed Aug. 17, 1978, Ser. No. 934,555
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737580
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—419 **6 Claims**

1. A method for the simultaneous production of a plurality of blocks of rod-shaped articles from a single row of said rod-shaped articles disposed side by side and comprising an integral multiple of the number of said rod-shaped articles to be formed into each block, the method comprising the steps of:

(a) providing said single row of said rod-shaped articles;

(b) forming said single row of said rod-shaped articles into a

plurality of groups of said rod-shaped articles each containing the same number of said rod-shaped articles and simultaneously with said formation of said groups disposing each group of said rod-shaped articles into a plurality of sub-groups of said rod-shaped articles by disposing each sub-group of each group of said rod-shaped articles



in a respective horizontal plane and in a stepped relationship with one another in said respective sub-group; and

(c) disposing the sub-groups in each group of rod-shaped articles in vertically overlying relationship to form a respective block of each said group of said rod-shaped articles.

4,217,980

SEALED HANGER BEARING FOR AUGER CONVEYOR

Dennis E. Kemp, Jr., P.O. Box 167, South Orange, N.J. 07079

Filed Nov. 30, 1978, Ser. No. 964,879
Int. Cl.[2] B65G *33/32*
U.S. Cl. 198—666 11 Claims

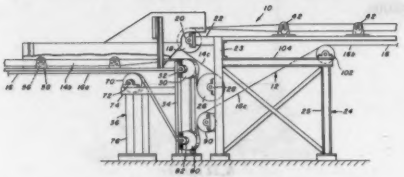
1. In a conveyor construction including a drive shaft, first and second auger sections mounted in axially spaced relation on said shaft, said sections including cylindrical core portions keyed to said shaft, the opposed ends of said core portions being disposed in predetermined spaced relation, the improvement which comprises a sealed hanger bearing assembly interposed between said sections in rotary sliding engagement with said shaft, said bearing assembly including a central, generally cylindrical housing of low friction bearing material, said housing having a bore surrounding said shaft, hanger means fixed to and supporting said housing, first and second end portions on said housing disposed in proximate spaced opposed relation respectively to said opposed ends of said core portions, said housing end portions including an annular recess surrounding said shaft, a wear-resistant, anti-friction washer member interposed between said ends of said core portions and said first and second ends of said housing, said washers each including a radially directed wiper portion intimately engaging the opposed ends of said housing outwardly of said recess, and a drive portion extending toward said shaft, said drive portions being disposed within said recesses, and a resilient, compressible, high friction drive gland disposed in each said recess in engagement with said shaft, said drive portions of said washers, and said ends of said cores, said glands yieldably biasing said wiper portions against said ends of said housing and forming a frictional drive connection between said shaft and said washers.

4,217,981

CONVEYING APPARATUS

Aubrey C. Briggs, Carnegie, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1972, Ser. No. 260,312
Int. Cl.[2] B65G *15/60*
U.S. Cl. 198—839 5 Claims



1. A conveying apparatus, comprising:

an endless conveyor belt having an upper work portion and a lower return portion;

at least one first guide means for guiding the upper work portion of said belt to provide first and second work runs having their paths of travel lying at an angle to each other, the discharge end of said first work run lying in a plane above the receiving end of said second work run, with the work runs being connected by a connecting loop,

said first guide means including a first elongated guide member at the discharge end of said first work run, a second elongated guide member at the receiving end of said second work run with its longitudinal axis at a preselected horizontal angle with respect to the longitudinal axis of the first guide member and a third elongated guide member disposed below the second guide member with the longitudinal axis thereof parallel to the longitudinal axis of the first elongated guide member, the longitudinal axes of said first, second and third guide members being perpendicular to the longitudinal axis of the endless conveyor belt, and said second and third guide members being aligned such that the endless conveyor belt moves vertically between said third guide member and the second guide member and is, therefore, twisted from the direction of travel of the first work portion to the direction of travel of the second work portion about a vertical axis; and

at least one second guide means for guiding the return portion of said conveyor belt.

4,217,982

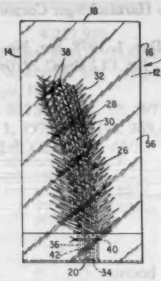
DISPLAY PACKAGE FOR FOLIAGE

Herbert M. Clamage, 9627 Kildare, Skokie, Ill. 60076

Filed Oct. 5, 1978, Ser. No. 948,913
Int. Cl.[2] B65D *85/52;* A01G *5/00*
U.S. Cl. 206—45.33 5 Claims

1. A display package for foliage such as ferns or the like having stem ends arranged grouped together, said package comprising a planar board, a plurality of foliage branches arranged grouped on the board, a return bent transverse lip formation along one end of said board and unitary therewith defining a pocket having open sides and a closed end, the free stem ends disposed terminating within said pocket and plastic sheeting shrinkably applied sealably to and surrounding said

board and foliage arranged thereupon totally encapsulating said board and foliage sealed from the exterior of said package,



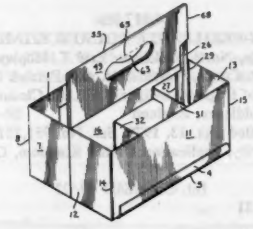
and puncture of the plastic sheeting by said stem ends being prevented by said closed end.

4,217,983

ARTICLE CARRIER

James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 30, 1979, Ser. No. 25,366
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—187 **5 Claims**



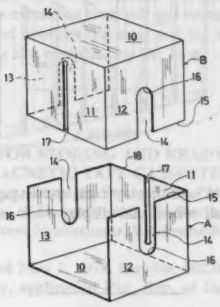
1. An article carrier comprising a bottom (2), side walls (1,11) foldably joined respectively to the side edges of said bottom, end wall panels (7,9,12,13) foldably joined respectively to the end edges of said side walls and extending inwardly of the carrier, a first pair of riser panels (16,17) foldably joined respectively to said end wall panels at one end of the carrier and extending medially inward of the carrier, a second pair of riser panels (26,27) foldably joined respectively to said end wall panels at the other end of the carrier and extending medially inward of the carrier, a first pair of handle panels (49,50) foldably joined respectively to said first pair of riser panels, a second pair of handle panels (51,52) foldably joined respectively to said first pair of handle panels along fold lines (56,57) offset inwardly from the associated end edges of said first pair of handle panels, and characterized in that a locking tab (67) is foldably joined to said associated end edge of one of said first pair of handle panels and disposed intermediate and in overlapping interlocked relation with said second pair of riser panels.

4,217,984

STORING AND DISPENSING BOX

Lars Magnuson, Gräfsnäs Säteri, Sollebrunn, Sweden (46030)

Filed Oct. 6, 1978, Ser. No. 949,213
Claims priority, application Sweden, Nov. 8, 1977, 7712577
Int. Cl.² B65D *85/672*
U.S. Cl. 206—403 **1 Claim**



1. A box, for storing and dispensing band-formed material wound to a spool upon a shaft, comprising:

(A) two identical components, each component having a base and only three walls, a back wall and two side walls, leaving an open fourth wall space, said walls being interconnected and connected to said base, each wall being defined by a top edge remote from said base and having a height slightly exceeding the diameter of said spool;

(B) a slot in each of said side walls extending from the top edge defining said side wall, about half-way towards said base, and being terminated by a bottom portion suited to carry one end of said spool shaft; and

(C) a slot in said back wall starting from the top edge defining said back wall and extending toward said base at least as far as the slots in said side walls;

(D) said slots thereby imparting resiliency to said walls, whereby one of said components will fit over the other of said components;

(1) as a cover when fitted over the top of said other component with the back wall of the cover superimposed over the open fourth wall space of the other component, and

(2) as a reinforcing base when fitted over said other component with the back walls of both of said components superimposed.

4,217,985

DISPLAY DEVICE FOR STORING AND DISPLAYING CARDS

Donald D. Nasgowitz, Milwaukee, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed May 15, 1978, Ser. No. 905,733
Int. Cl.² A47F *7/00*
U.S. Cl. 211—50 **8 Claims**

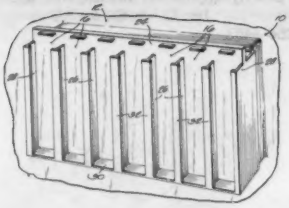
1. A display device for storing and displaying a plurality of cards, said display device comprising:

a supporting structure including a generally vertical wall;

a display rack supported by said vertical wall and having an upper portion and a lower portion, said display rack including a planar dividing wall having a front face and a rear face, a plurality of adjacent display compartments supported by said front face, and a plurality of storage compartments supported by said rear face for supporting cards therein; and

means for supporting said display rack in a first position adjacent said vertical wall, and a second forwardly inclined position wherein the upper portion of said display

rack is spaced from said vertical wall and the lower portion is positioned adjacent the vertical wall, said supporting means including at least one hook projecting rear-



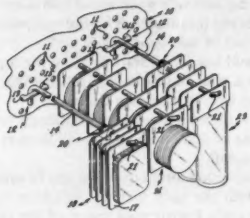
wardly from said display rack and engageable with said vertical wall when said display rack is in said second position.

4,217,986

INVENTORY RESTRAINING DEVICE FOR MERCHANDISE DISPLAY HOOK

Donald M. Brown, 3960 Wilshire Blvd., Los Angeles, Calif. 90010

Filed May 8, 1978, Ser. No. 903,889
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—57.1 **3 Claims**



1. Apparatus for displaying merchandise of the type wherein the merchandise is attached to a card having a hole through it, said apparatus comprising in combination:

a base;

a rod having a back end attached to said base, said rod extending from the base to a front end and passing through a hole in a card; and,

a unitary restraining device of resilient material of a uniform horseshoe-shaped cross section consisting of two arms extending from a body a distance exceeding the diameter of the hole in the card, a re-entrant cavity being defined between said arms, the closest spacing between said arms being less than the diameter of said rod, whereby when a central portion of said rod is forced into removable engagement with the re-entrant cavity defined between the arms a resilient restoring force is produced causing the arms to grip said rod so tightly that said restraining device can be moved along said rod only by a force deliberately applied to said restraining device by an operator;

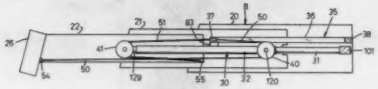
said restraining device thusly removably engaging said rod at a position between the card and said base to prevent casual applied forces weaker than the deliberately applied force from moving the card along said rod toward the back end of said rod.

4,217,987

ACTUATOR FOR TELESCOPIC BOOM

Narahari Gattu, and Paul E. Johnson, both of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Dec. 1, 1978, Ser. No. 965,561
Int. Cl.[3] B66C 23/04
U.S. Cl. 212—144 **18 Claims**



1. In a telescopic boom:

a first section **(20)**;

a second section **(21)** telescopable within said first section **(20)**;

a third section **(22)** telescopable within said second section **(21)**;

an extendable and retractable motor **(30)** comprising two relatively movable components **(31, 32)**;

one **(31)** of said components being connected to said first section **(20)**;

the other **(32)** of said components being connected to said second section **(21)**;

first **(40)** and second **(41)** pulleys mounted for movement with said other component **(32)** and with said second section;

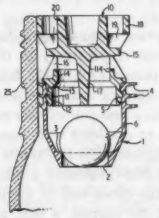
and first **(50)** and second **(51)** cables reeved around said first **(40)** and second **(41)** pulleys, respectively, and connected between said first section **(20)** and said third section **(22)**, whereby operation of said motor **(30)** effects movement of said second section **(21)** relative to said first section **(20)** and movement of said third section **(22)** relative to said second section **(21)**.

4,217,988

NON-REFILLABLE POURER FITMENT

Frederick Mills, North Walsham; Eric T. Hopley, Poringland; Raymond D. Curtis, Northfields, and Patrick M. Wraighte, Buxton, all of England, assignors to U.G. Closures & Plastics Limited, Middlesex, England

Filed Oct. 13, 1978, Ser. No. 951,251
Claims priority, application United Kingdom, Oct. 20, 1977, 43701/77
Int. Cl.[2] B65D 49/02
U.S. Cl. 215—21 **4 Claims**



1. A non-refillable pourer fitment for the neck of a container comprising inner and outer parts captively attached to each other, a valve member located and movable in a longitudinal bore in the inner part and the outer part being formed with a longitudinal bore at its inner end and a dispensing aperture at its outer end, first and second valve seats in said inner and outer parts respectively, an obturator disc frangibly attached to a body portion of the outer part, said body portion including the

said longitudinal bore and said second valve seat, and an inwardly extending peg on the obturator disc controlling the limit of movement of the valve member.

4,217,989

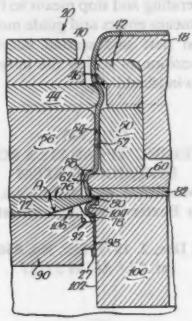
TAMPER-PROOF CLOSURE

Robert W. George, Naperville, Ill., assignor to National Can Corporation, Chicago, Ill.

Division of Ser. No. 832,176, Sep. 12, 1977. This application Dec. 1, 1978, Ser. No. 965,430

Int. Cl.[2] B65D *41/32*

U.S. Cl. 215—253 8 Claims



1. A tamper-proof closure having a substantially flat top and a generally cylindrical skirt extending from the perimeter of said substantially flat top with said skirt having a free edge, a plurality of circumferentially spaced lines of weakness extending generally parallel to the axis of said skirt, each of said lines of weakness having a thickness at its end closest to said free edge which is greater than the thickness at an opposite end thereof.

4,217,990

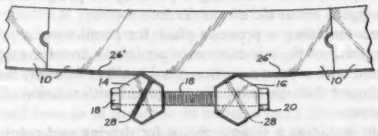
ADJUSTABLE HOOP CLAMP FOR TANKS OR THE LIKE

Wade D. Ripley, 2764 NW. Thurman St., Portland, Oreg. 97210

Filed Feb. 12, 1979, Ser. No. 11,509

Int. Cl.[3] B65D *63/08*

U.S. Cl. 217—95 5 Claims



1. An adjustable clamp for a hoop arranged to encircle the outer side of the upstanding peripheral wall of a tank or the like, comprising:

(a) a pair of elongated clamp blocks each having a longitudinal dimension, defined by opposed top and bottom ends, and a transverse dimension extending normal to the longitudinal dimension,

(b) a pair of clamp screws extending through longitudinally spaced transverse openings in the pair of clamp blocks for securing the clamp blocks adjustably in longitudinally vertical, laterally spaced relation,

(c) a longitudinally extending slot in each clamp block extending transversely through the block at an angle relative to the clamp screws, and

(d) an elongated flat strap,

(e) the strap being arranged as an open loop for encircling a peripheral wall with the opposite end portions of the strap extending radially outward relative to the encircling loop transversely through the vertically extending slots in the vertically disposed clamp blocks, thence around the vertical surfaces of the clamp blocks which face each other, inward toward the loop, and thence with the terminal end sections of the end portions extending laterally of the blocks away from each other along the inner surface of the strap adjacent the associated end portion, whereby said laterally extending terminal end sections of the strap are interposed between the strap and the outer surface of a tank or the like encircled by the loop.

4,217,991

DEVICE FOR STORING AND READYING OF MAGNETIC TAPE CASSETTES

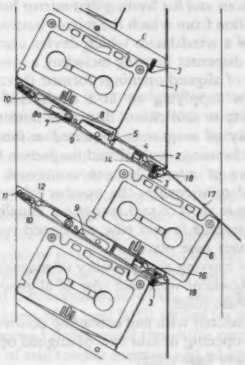
Horst Neuhaeusser, Danziger Strasse 116, 7313 Reichenbach-/Fils, Fed. Rep. of Germany, and Ole Storm, Oslo, Norway, assignors to Horst Neuhaeusser, Reichenbach/Fils, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,085

Claims priority, application Fed. Rep. of Germany, May 2, 1977, 2719493

Int. Cl.[2] G07F *11/00*

U.S. Cl. 221—89 11 Claims



1. An article storing and dispensing device adapted for storing and readying magnetic tape cassettes so that they can be automatically, individually dispensed from the device, said device comprising:

a supporting frame structure including two opposing side wall-members;

a least one support member for an article to be dispensed, said support member including an inclined bearing surface mounted between said opposing side wall members at an incline from the horizontal plane sufficient for the article to be dispensed to descend under its own weight, whereby there is defined an article storing compartment;

a stop member mounted on said frame structure at a position above said inclined bearing surface at the forward end of said article storing compartment; and

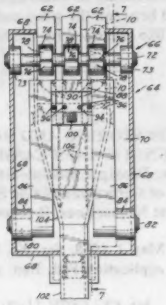
means associated with said support member, for selectively raising an article to be dispensed above said inclined bearing surface upon insertion of the article into said article storing compartment, so that the article abuts against said stop member in order to prevent the article from descending down said support member and to thereby hold the article in a ready position, and for selectively lowering the article so that it is released from abuttment against said stop member in order to dispense the article along said inclined bearing surface by the force of gravity.

4,217,992

DEVICE FOR DISPENSING A MIRROR BUTTON

William K. Timmons, Ann Arbor, and George A. Koss, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 29, 1979, Ser. No. 25,150
Int. Cl.[3] B65G 59/06
U.S. Cl. 221—113 11 Claims



1. A device for dispensing a mirror button from a stack of mirror buttons and for feeding that mirror button to a predetermined position from which the mirror button can be bonded to a surface of a windshield, which device comprises:

a closed dispenser housing including a lower base plate with a row of aligned openings formed therein;

means for supplying air at a controlled temperature and humidity to said closed dispenser housing;

a plurality of magazines mounted within said closed dispenser housing, each of said magazines having a plurality of rows of mirror buttons contained therewithin in a stacked relationship, the number of rows of the mirror buttons in each of said magazines equaling the number of said openings in said row of aligned openings formed in said lower base plate;

means for moving said plurality of magazines one at a time into alignment with said row of aligned openings in said lower base plate;

tubes connected with and extending downwardly from each of said opening of said row of aligned openings formed in said lower base plate;

blocking means associated with said tubes for controlling the flow of said rows of stacked mirror buttons from said tubes in a manner that a plurality of rows of mirror buttons from a magazine having its rows aligned with said openings of said row of aligned openings in said lower base plate are allowed to move past said blocking means one row at a time;

dispensing means associated with each of said tubes and located below said blocking means for dispensing said buttons one at a time from a row of said mirror buttons, the flow of which is being allowed by said blocking means;

guide means connected to said dispensing means for carrying a dispensed button along a predetermined path;

propelling means associated with said guide means at a location adjacent said dispensing means, said propelling means for supplying a propellant force to cause movement of a dispensed mirror button along said guide means;

first decelerating and stop means positioned along the path of said guide means for slowing down a propelled mirror button near the end of said guide means and for preventing the return of that mirror button to a position behind said first decelerating and stop means after that mirror button has passed thereby;

second decelerating and stop means positioned along the path of said guide means between said first decelerating and stop means and the end of said guide means for decelerating the mirror button and stopping that mirror button in a position between said two decelerating and stop means;

a placement and position means for movement into and along a final portion of said predetermined path of said guide means from a first location before said first decelerating and stop means to a second location after said second decelerating and stop means which second location is a position that locates the mirror button in a position for application to a windshield; and

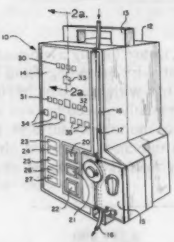
means for actuating said placement and position means after a mirror button is located between said first and said second decelerating and stop means so that said placement and position means enters said guide means and moves the mirror button past said second decelerating and stop means to a position in which the mirror button may be applied to a windshield.

4,217,993

FLOW METERING APPARATUS FOR A FLUID INFUSION SYSTEM

Thurman S. Jess, Mundelein, and Norm Shim, Glenview, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1977, Ser. No. 856,863
Int. Cl.[2] A61M 31/31
U.S. Cl. 222—14 11 Claims



1. Metering apparatus for controlling the flow of fluid through a fluid infusion set, comprising:

a housing;

a rotor mounted on said housing for rotation about a fixed axis, said rotor including a plurality of pressure rollers disposed about the circumference thereof;

means including a pressure plate for positioning a tubing segment of the administration set in compressive engagement with at least a portion of said rollers whereby fluid is pumped through said tubing segment with rotation of said rotor;

means including a stepper motor for driving said rotor;

first motor control means for generating stepping pulses at a first predetermined rate for controlling the rotation of said stepper motor to obtain a desired flow rate through said tubing segment;

second motor control means for generating stepping pulses at a second predetermined rate for maintaining a desired minimum flow rate through said tubing segment;

volume totalizer means including a register responsive to said stepping pulses for interrupting application of stepping pulses from said first motor control means and initiating application of stepping pulses from said second motor control means to said stepper motor upon passage of a desired volume of fluid through said tubing segment; and

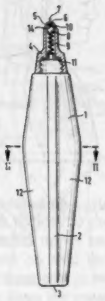
inhibiting means responsive to the flow rate established by said first motor control means for inhibiting operation of said second motor control means when said predetermined rate is less than a predetermined maximum rate.

4,217,994

GLUE DISPENSER IN FORM OF A BOTTLE

Claus Koenig, Erlangen, and Reinhard Koenig, Buckenhof, both of Fed. Rep. of Germany, assignors to Claus Koenig K.G., Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 789,846
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617862
Int. Cl.[2] B05C 5/02; B65D 37/00
U.S. Cl. 222—212 1 Claim



1. A glue dispenser bottle made of elastic material comprising

a body portion adapted to contain a glue supply,

a hollow conically shaped applicator tip on one end of said body portion,

said body portion being longitudinally tapered in the direction away from said tip and having a plurality of longitudinal ribs on the exterior thereof whereby said bottle when laid on a horizontal surface is prevented from rolling thereon and assumes on orientation wherein said applicator tip is upwardly oriented,

a round bore through the apex of the conically shaped applicator tip,

a cylindrical rod mounted within said bore for longitudinal movement therein and having an inner end adjacent an inner part of said bore and an outer end protrudable out of an outer part of said bore,

said cylindrical rod having a diameter smaller than that of said bore so as to define an annular space therebetween,

said annular space defining a flow path through which glue flows,

a sealing washer fixed in said tip in alignment with said bore,

ball valve means comprising a ball engaging said washer in a closed position, said ball being adjacent the inner end of said rod to contact the same, and

a coil compression spring biasing said ball valve means toward the inner end of said rod to a normally closed position,

whereby said outer end of said rod may be depressed for moving said ball valve means to an open position against the bias of said spring whereupon glue flows out of said space when the bottle is compressed, and

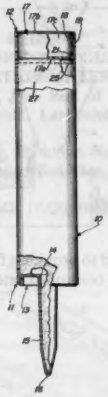
said spring means being such as to produce less force on said ball than pressure difference caused by the elasticity of said bottle whereby air flows back through said space when the bottle is released to clear glue from said space irrespective of the position of said rod.

4,217,995

CAULKING TUBE WITH AN IMPROVED SEAL TO RETARD THE PASSAGE OF AIR

Robert J. Robillard, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 619,578, Oct. 6, 1975, abandoned. This application Feb. 28, 1978, Ser. No. 882,301
Int. Cl.[3] B65D 83/00
U.S. Cl. 222—327 7 Claims



1. A caulking tube with an improved seal to retard the passage of air into the tube having a tubular body member with a first end and a second end, a cap plate with an opening therein connected to a first end of said tubular member, and a protruding tubular nozzle member with a sealed tip at one end and an opening at the other end connected at its open end to said cap plate over the opening at said cap plate comprising the improvement wherein the internal surface of said tubular member is coated with a moisture proof cohesive, inorganic or organic chemical material which is selected from the class consisting of polyethylene based microcrystalline waxes, and latexes, which is applied at a thickness of at least 0.001 inches for at least 0.25 inches from said second end around the entire circumference of said second end of said tubular member and wherein a round integral plunger member constructed from plastic with a front face and a rear face is inserted into said tubular member at its second end to form an airtight seal provided that the front face does not extend beyond said coating.

4,217,996

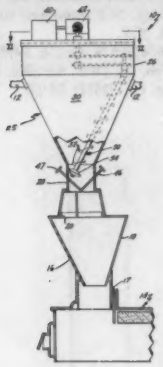
MATERIAL STORAGE AND FEEDING DEVICE

Lewis D. Good, 7579 - 100th St., SE., Caledonia, Mich. 49316

Filed Sep. 27, 1978, Ser. No. 946,390
Int. Cl.[2] B01F 7/04
U.S. Cl. 222—404 23 Claims

1. A material feeding mechanism comprising a hopper having an axis, an inlet end, an outlet end smaller than said inlet end, and sides tapering between said inlet and outlet ends; a rotor arm mounted adjacent said hopper inlet end for rotation generally about said hopper axis; a rigid agitator rotatably mounted on said arm and extending downwardly through said hopper to a position adjacent said hopper outlet end; drive means for rotating said arm and said agitator such that when said hopper contains material such as sawdust or the like, said arm will be revolved about said hopper axis until resistance to

such revolution is met, such resistance causing said agitator to be rotated about its own axis whereby any material in said



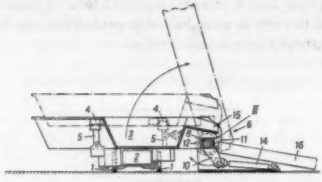
hopper will be loosened to provide a flow of material from said hopper outlet end at a controlled rate.

4,217,997

ARRANGEMENT AT A CONTINUOUS CASTING PLANT

Alois Scheinecker; Werner Scheurecker, both of Linz, and Gerhard Mühlbauer, Steyr, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Feb. 21, 1979, Ser. No. 13,228
Claims priority, application Austria, Mar. 8, 1978, 1653/78
Int. Cl.[2] B22D *11/10*
U.S. Cl. 222—604 **8 Claims**



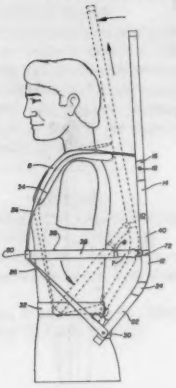
1. In an arrangement at a continuous casting plant of the type including a movable carrier, a tundish, lifting means for lifting and lowering said tundish, said tundish and lifting means being mounted on said movable carrier, a tilting stand, and a tilting device mounted on said tilting stand for emptying said liftable and lowerable tundish, the improvement which is characterized in that said tilting device includes a tilting beam, said tilting beam being rotatable about its longitudinal axis and having a certain cross section, and said liftable and lowerable tundish, at its lower side, possesses generally downwardly open recesses, said recesses corresponding to said certain cross section of said tilting beam, said liftable and lowerable tundish being lowerable at said tiltable stand so that the recesses come into positive connection with said tilting beam.

4,217,998

ADJUSTABLE WEIGHT BALANCING DEVICE FOR A BACKPACK FRAME

James E. Alexander, 13739 Woodcock Ave., Sylmar, Calif. 91342

Continuation of Ser. No. 684,742, May 10, 1976, abandoned.
This application Mar. 5, 1979, Ser. No. 17,440
Int. Cl.[3] A45F *3/10*
U.S. Cl. 224—261 **8 Claims**



1. An improved backpack, said backpack comprising, in combination:

a. an elongated rear frame having a pair of laterally spaced generally vertically extending frame members;

b. a pair of shoulder straps, each said strap being connected to one of said rear frame members at two spaced points, one above the other, said strap extending forward; and,

c. a pair of novel weight-balancing devices, each said device comprising, in combination,

i. a first elongated support member projecting forward of said rear frame,

ii. a second elongated support member projecting forward of said rear frame,

iii. lock means adjustably releasably locking said first and second elongated support members together in telescoping relation,

iiii. retaining means secured to one end of said first elongated support member and releasably receiving one of said shoulder straps along the length thereof,

iiiii. rear frame engaging means secured to one end of said second elongated support member and releasably engaged to said one of said rear frame members,

d. each of said two weight balancing devices being disposed in side by side, spaced, general parallel relation, attached to separate ones of said shoulder straps and rear frame members, and

e. whereby the relationship of said frame with respect to the wearer thereof can be changed by movement of said retaining means along the length of the shoulder strap.

4,217,999

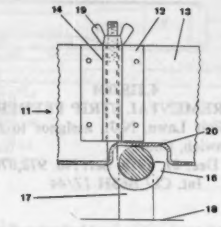
SKICASE

Hans E. Forsman, Strängnäs, Sweden, assignor to Forsman Armerad Plast AB, Strängnäs, Sweden

Filed Feb. 16, 1978, Ser. No. 878,327
Int. Cl.[2] B60R *9/12*
U.S. Cl. 224—319 **4 Claims**

1. A skicase for transportation on a top carrier of an automobile comprising two completely separate main parts comprising a top part and a bottom part which may be removed therefrom, both of said parts having side and end walls, said top part having an outer border of its walls shaped for overlapping and

tightly surrounding an upper border of the walls of said bottom part, the one end wall of said top part being formed with an internally concave nose which fits over and nests with a corresponding convex end on the bottom part for self-locking engagement with said corresponding end wall of said bottom part, locking means for connecting said two main parts with each other at the end which is opposite to said nesting end, and fastening means to secure said bottom part to a top carrier of an automobile, said fastening means comprising a plurality of hook members for engaging a top carrier, each hook member



having a bolt-like stem extending vertically through said bottom part at a point which is close to the inside of its side walls, said stem having a threaded upper end extending above said side wall and a wing nut on said threaded stem, said hook member securing said bottom part to said top carrier, said wing nut being non-accessible from the outside of said skicase when the top part is placed and locked to the bottom part, and said side walls of said top part interfering with and preventing said wing nut from unscrewing itself responsive to automobile vibration.

4,218,000

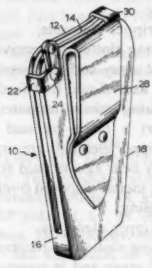
PISTOL HOLSTER

Robert L. Mixson, 8016 W. 18th Ave., Hialeah, Fla. 33014

Filed Nov. 27, 1978, Ser. No. 963,895

Int. Cl.³ F41B *13/04*

U.S. Cl. 224—911 **7 Claims**



1. An open front holster for a pistol, revolver, or the like comprising:

first and second panels of a somewhat flexible material, each of said panels having a front, a rear, a top, and a bottom edge;

a belt attaching means affixed to one of said panels on the outside;

a filler connected between a substantial portion of the bottom and rear edges of said first and second panels joining said first and second panels together, the first and second panels in conjunction with the filler forming a compartment for receiving said pistol or revolver;

a barrier wall connected between the bottom, front edges of said first and second panels, disposed below the front opening between said first and second panels, said barrier wall extending slightly above the bottom of said compartment for engaging the barrel end of a pistol or revolver resting in said compartment to prevent said barrel end from rotating through said opening from said pistol rest portion;

a rear strap connecting said first and second panels along the upper rear edge of said holster; and

means for releasably connecting said first and second panels together at the upper front edges of said first and second panels.

4,218,001

BLOW BOX FOR SUSPENDED GUIDANCE AND/OR CONVEYANCE OF STRIP MATERIAL OR SHEETS

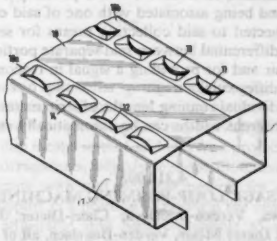
Hilmar Vits, Leichlingen, Fed. Rep. of Germany, assignor to Vits-Maschinenbau GmbH, Langenfeld, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,375

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1978, 2802610

Int. Cl.² F26B *13/20*; B65H *17/32*

U.S. Cl. 226—97 **12 Claims**



1. A blow box for suspended guidance and/or conveyance of strip material or sheets in which a blow means is blown with the effect of a blow jet issuing from a slot nozzle at an incline against the strip material or sheets to be conveyed, the blow box comprising:

a barrier wall adapted for placement in facing relationship to the strip material or sheets;

at least one row of blast openings arranged in said barrier wall so as to be close to one another in the direction of conveyance of the strip material or sheets and facing thereof; and,

each said blast opening including;

a tongue positioned in said barrier wall, said tongue having a tip sunk into said blow box;

an inclined guide surface separate from said tongue sunk into said blow box,

a pair of edge portions each of which extend into said barrier wall and is connected with said inclined guide surface, and

said guide surface together with said pair of edge portions being positioned around said tongue inwardly of said barrier wall so that the blow jet issuing from each blast opening diverges towards the ends of the blow box and leaves the blast opening radially.

4,218,002

STRIP MATERIAL CENTER GUIDE ASSEMBLY

John M. Whalen, Ansonia, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 31, 1979, Ser. No. 44,182

Int. Cl.³ B65H *17/32*

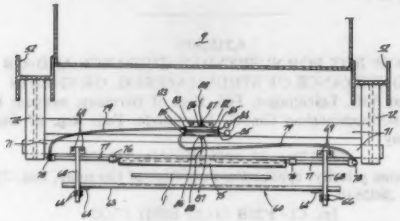
U.S. Cl. 226—97 **21 Claims**

1. A center guide assembly comprising means for automatically maintaining without mechanical adjustment a desired centerline path of travel for moving individual strip material

segments which can have widely different widths, said automatic maintaining means including:

means in substantial spanning relation to said path of travel on one side of and extending beyond both edges of said strip for continuously supplying a flow of air across said path of travel of said material;

means in substantial spanning relation to said path of travel on the other side of said strip for collecting two separate



portions of said flow of air, said separate portions each passing and being associated with one of said edges; and

means connected to said collecting means for sensing any pressure differential between said separate portions of said flow or air and for providing a signal in response to said pressure differential,

whereby individual running lengths of strip material having widely different widths can be automatically centered.

4,218,003

SAUSAGE LOOP-FORMING MACHINE

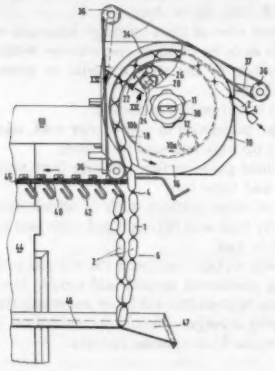
Manfred Plewa, Verden-Dauelsen; Claus-Dieter Jaschinski, Verden, and Dieter Meier, Verden-Dauelsen, all of Fed. Rep. of Germany, assignors to Vemag Verdener Maschinen-und Apparatebau GmbH, Verden, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,527

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744350

Int. Cl.[2] B65H *17/42*

U.S. Cl. 226—104 **15 Claims**



1. An improved loop-forming machine for use with a chain of sausage links, said machine comprising:

a series of hooks connected at spaced intervals to an endless length conveyor disposed in a horizontal plane, each of said hooks having a generally V-shaped section, said V-shaped section including an end arm extending upwardly and forwardly, said V-shaped section being open in the direction of the advance of the sausage loop-forming conveyor;

a feeder mechanism adapted to discharge the sausage chain in generally vertical fashion into the path of said hooks for forming sausage chain loops on each of said hooks; and

a sensor operable to sense the number of individual sausage links discharged by said feeder mechanism, means responsive to said sensor for controlling advancement of said conveyor to deposit a selected loop size formed on each of said hooks.

4,218,004

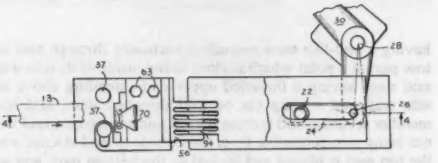
INCREMENTAL STRIP FEEDER

John W. Rouse, Fair Lawn, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 21, 1978, Ser. No. 972,070

Int. Cl.[2] B65H *17/44*

U.S. Cl. 226—149 **3 Claims**



1. An apparatus for incrementally advancing strip material comprising:

(a) a base;

(b) a first feeding surface mounted on said base, with an input end and a discharge end;

(c) a second feeding surface mounted in alignment with and coplanar to said first feeding surface with an input end and a discharge end;

(d) a first gripping means disposed over said first feeding surface comprising:

(i) a plurality of gripper elements;

(ii) a gripper housing slotted to receive said gripper elements in parallel array and in transverse disposition to the longitudinal axis of said first feed surface;

(iii) a gripper biasing means mounted on said gripper housing to exert a force on said gripper elements whereby said gripper elements are urged to slide in said slots and thereby bear against said strip metal;

(e) a second gripping means disposed over said second feeding surface comprising:

(i) a plurality of gripper elements;

(ii) a gripper housing slotted to receive said gripper elements in parallel array and in transverse disposition to the longitudinal axis of said second feed surface;

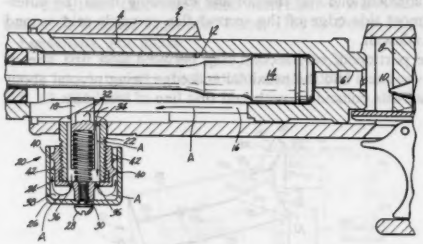
(iii) a gripper biasing means mounted on said gripper housing to exert a force on said gripper elements whereby said gripper elements are urged to slide in said slots and thereby bear against said strip metal; and

(f) means for reciprocating, in unison, said second feeding surface and said second gripping means toward and away from said first gripping means whereby said second gripping surface and second gripping means cooperate to seize and advance said strip metal toward said first gripping means and releases said strip metal as they reciprocate away from said first gripping means and whereby said first feeding surface and said first gripping means cooperate to accept said strip metal as it is advanced and to seize and hold said strip metal when said second gripping means reciprocates away from said first gripping means.

4,218,005
BAFFLED VENTING OF GAS FROM A POWDER ACTUATED TOOL

Frederick J. Harris, Clinton, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jul. 30, 1979, Ser. No. 61,714
Int. Cl.³ B25C 1/14
U.S. Cl. 227—10 3 Claims



1. In a powder-actuated tool of the type having a housing; a barrel connected to said housing, said barrel having a bore; a fastener-driving piston slidably mounted in said barrel bore; a slot extending through said barrel and opening into said barrel bore; and a pawl extending through said slot for traversing movement through said slot for returning said piston from a fired position to a firing position, an improved venting system for venting combustion gases from said barrel bore to the atmosphere, said venting system comprising:

(a) a pawl housing secured to said housing, said pawl housing containing said pawl;

(b) means forming a first bore in said pawl housing about said pawl;

(c) means providing an enlarged clearance between said pawl and said slot and opening into said first bore whereby combustion gases are caused to flow from said barrel bore, through said slot and into said first bore;

(d) means forming a second bore in said pawl housing, said second bore being vented to the ambient atmosphere;

(e) means providing fluid communication between said first bore and said second bore whereby combustion gases expelled into said first bore will flow therefrom into said second bore; and

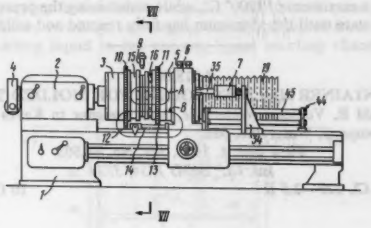
(f) baffle means disposed in at least one of said first and second bores for cooling combustion gases flowing therethrough.

4,218,006
BELLOWS SECTIONS WELDER

Vladimir S. Atrepiev, Tuchkovskaya ulitsa, 6, kv. 95; Mark L. Vinokur, Davydkovskaya ulitsa, 38, kv. 100, and Genrikh F. Murov, ulitsa 1905 goda, 11, kv. 15, all of Moscow, U.S.S.R.

Filed Aug. 16, 1978, Ser. No. 934,267
Int. Cl.² B23K 37/04
U.S. Cl. 228—48 8 Claims

1. A welder for welding sections of bellows, comprising: a bed; a stationary support mounted on said bed; a rotatable driver chuck mounted on said stationary support; a movable support; a rotatable driven chuck mounted on said movable support with said movable support mounted on said bed for axial movement between a first position closely spaced from said driver chuck and a second position spaced a greater distance from said driver chuck, a bellows section to be welded being insertable between said chucks when said movable support is in said second position; a drive for rotating said driver chuck; a gear train for providing kinematic coupling between said driver and driven chucks; a support mounted on said bed adjacent said driver chuck and carrying a welding torch; a plurality of pneumatic cylinders mounted between said bed and said movable support for moving said movable support between said first and said second positions, the cylinders being rigidly coupled to said movable support and arranged symmetrically with respect to the longitudinal axis of the welder; annular clip means mounted on each of said chucks and extending towards each other, one clip means per each chuck, one of said clip means being spring-loaded in the direction of its chuck; split collar springs mounted on said clip means, one split collar spring per each clip means, said split collar springs having projections on their end faces to interact with respective recesses of corrugations of the bellows sections being welded; an expanding yoke for centering outer diameters of bellows sections being welded, said yoke being mounted on said bed between said chucks and resting, when in a working

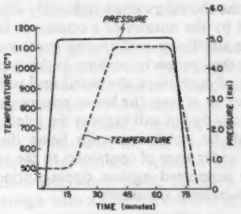


position, on said split collar springs and in engagement with the bellows sections to center said sections, two swivel means, each intended for tightening the respective split collar spring about said clip means so that said end face projections interact with the corrugations; adjustable stops mounted on said bed and interacting with said movable support for stopping said movable support in a position to perform the centering operation, said adjustable stop being releasable to allow further movement of said movable support to said first position to effect clamping of said bellows sections about their entire periphery; and means for receiving welded bellows sections mounted on said bed behind said movable support.

4,218,007
METHOD OF DIFFUSION BONDING DUPLEX SHEET CLADDING TO SUPERALLOY SUBSTRATES

William F. Schilling, Rexford, and Adrian M. Beltran, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1979, Ser. No. 13,926
Int. Cl.² B23K 19/00; B23P 15/04
U.S. Cl. 228—194 10 Claims



1. A method of applying a duplex sheet cladding to a structural substrate, said method comprising the steps of:

(a) assembling an inner aluminum sheet cladding to the substrate so that the cladding closely conforms to the substrate;

(b) assembling an outer MCrAlY sheet cladding to the substrate having the inner aluminum sheet cladding assembled thereon whereby the outer corrosion resistant sheet

cladding completely envelops and seals the inner sheet cladding;

(c) placing the cladding substrate assembly into a deformable container;

(d) filling the container with a glass pressure transmitting medium so as to completely immerse the cladding-substrate assembly therein;

(e) sealing the container so that it is air-tight;

(f) diffusion bonding the cladding to the substrate by a hot isostatic pressing cycle wherein the temperature is initially maintained below the melting point of aluminum, the pressure is increased to establish intimate contact of the inner sheet cladding with the substrate and the outer sheet cladding, and thereafter the temperature is increased up to a maximum of 1200° C., while maintaining the pressurized state until the aluminum has fully reacted and solidified.

4,218,008

CONTAINER HOLDING SOCKET FOR MOLDED TRAY

Gerald R. Veilleux, Waterville, Me., assignor to Keyes Fibre Company, Waterville, Me.

Filed Jun. 1, 1979, Ser. No. 44,503

Int. Cl.³ B65D *1/34, 3/24*

U.S. Cl. 229—2.5 R **10 Claims**

1. A unitary tray molded to substantially finished form of resilient material with horizontal and sloping but no substantially vertical wall portions to permit like empty trays to be nested one within another in a stack of such trays for shipment and storage, the tray including at least one socket for holding a cup-shaped container within a predetermined range of sizes of such containers, the container holding socket comprising three stabilizing shoulders positioned in spaced apart opposition to each other around the container holding socket at a height significantly above the level occupied by the bottom of a container fully inserted in the socket, characterized in that an inwardly contoured stabilizing wall extends downwardly beneath each of the shoulders to a height only slightly above the level occupied by the bottom of a container fully inserted in the socket, the stabilizing walls being contoured inwardly to the extent that they properly position in the socket at least the narrower sizes of containers, the stabilizing walls being yieldable so that they or at least the lower portions of them will be moved outwardly by but still support the intermediate sizes of containers, and the stabilizing walls being displaceable outwardly by the wider sizes of containers to the extent that such containers are supported against tipping principally by the spaced apart stabilizing shoulders.

4,218,009

FIBREBOARD BOX CLOSURE

Alva G. Don Carlos, Tonganoxie, Kans., assignor to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed May 14, 1979, Ser. No. 38,383

Int. Cl.² B65D *5/08, 5/10*

U.S. Cl. 229—39 R **9 Claims**

1. A box having interlockable closure flaps and comprising:

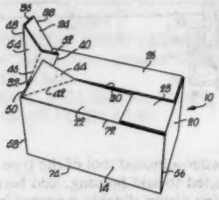
a bottom wall having four sides;

first, second, third, and fourth sidewalls respectively secured to the side edges of said bottom wall, extending upwardly therefrom, and being interconnected to one another; and

first, second, third and fourth closure flaps respectively secured to the upper margins of corresponding sidewalls and each presenting an outermost side edge remote from the corresponding sidewall, and spaced end edges extending transversely of the outermost side edge,

said second flap having a first line of weakness thereon adjacent one end thereof and extending from the outermost side edge of the second flap towards said second sidewall,

the portion of said second flap between said first line of weakness and the proximal end edge being pivotal about an axis coincident with said first line of weakness,



said third flap being adjacent said second flap and having second and third lines of weakness thereof adjacent the end of the third flap closest to the second flap,

said second and third lines of weakness each extending from respective points on the outermost side edge of the third flap towards the third sidewall,

the segment of said third flap between said second line of weakness and the proximal end edge of the third flap being pivotal about a second axis coincident with the second line of weakness,

the part of said third flap between said second and third lines of weakness being pivotal about a third axis coincident with the third line of weakness.

4,218,010

CONTAINER LID CONVERTIBLE INTO SPOON

Stanley L. Ruff, 9 Arbor Dr., New Rochelle, N.Y. 10804

Filed Jun. 11, 1979, Ser. No. 47,379

Int. Cl.² B65D *3/16, 51/24*

U.S. Cl. 229—43 **9 Claims**

1. A container lid adapted to be converted into a scooptype spoon, said lid being formed of a single piece of waterimpermable thermoplastic material and having a flat peripheral ring with a circular outer circumference defining an inner area of three-dimensional configuration in the shape of an embryonic scooptype spoon which includes a shallow trough extending diametrically between opposed zones of the inner circumference of the ring, said trough having a wide front end and a narrow rear end, the front end flaring outwardly and terminating in the plane of the ring, said inner area further including wings that extend outwardly to the inner circumference of the rim from the side edges of the trough and terminate at their front ends at the terminations of the front ends of the side edges

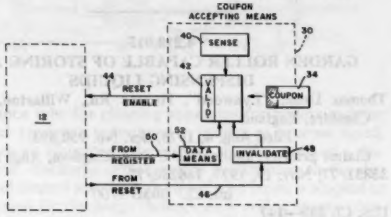
of the trough at the inner circumference of this rim whereby when the periphery of the run is squeezed by finger pressure at the wings the rear ends of the trough and the wings collapse upon one another to form a spoon handle and the front portion of the trough is narrowed and deepened to form a spoon bowl.

4,218,011

COUPON CONTROLLED METERING DEVICE

Luther G. Simjian, Lago Mar Place, 1750 S. Ocean La., Fort Lauderdale, Fla. 33316

Filed May 15, 1979, Ser. No. 39,170
Int. Cl.[3] G06F *15/20*; G06K *15/00*
U.S. Cl. 235—375 **12 Claims**



1. A metering device of the postage meter type or similar type comprising:

a metering mechanism including printing means for printing adjustable indicia representative of monetary units;

register means including a credit register and a cumulative register coupled to said printing means for registering in response to the operation of said printing means respectively the credit balance remaining in the metering mechanism and the cumulative monetary units printed;

control means coupled to said credit register and said printing means for precluding operation of said printing means when said credit register assumes a condition representative of a minimum credit balance;

resetting means coupled to said credit register for resetting said credit register to a condition representative of an increased credit balance;

coupon accepting means coupled to said metering mechanism for accepting a coupon;

validation means cooperatively associated with said coupon accepting means and coupled to said resetting means for determining the validity of a coupon accepted by said coupon accepting means and in response to a coupon being determined valid rendering said resetting means operable for resetting said credit register to a condition representative of an increased credit balance;

invalidating means coupled to said resetting means and said coupon accepting means for invalidating a coupon determined valid responsive to said resetting means having been rendered operable and reset said credit register, and

further means coupled to said resetting means and said register means for providing said coupon with data indicative of the condition of said register means.

4,218,012

METHOD OF RAPIDLY DISSOLVING A PARTICULATE SUBSTANCE IN A LIQUID

Hassan A. Hamza, and Jan Visman, both of Edmonton, Canada, assignors to Canadian Patents & Development, Ottawa, Canada

Filed Aug. 14, 1978, Ser. No. 933,551
Claims priority, application Canada, Sep. 1, 1977, 285999
Int. Cl.[3] B01F *3/12*; B05B *1/34, 7/14*
U.S. Cl. 239—10 **1 Claim**

1. A method of rapidly dissolving a particulate substance in a liquid, comprising:

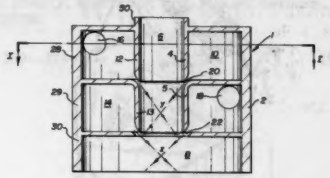
(a) continuously feeding the particulate substance along a path,

(b) feeding liquid to a first, liquid swirling chamber to swirl therein around the path of the particulate substance,

(c) feeding liquid to a second, liquid swirling chamber to swirl therein around the path of the particulate substance,

(d) spraying from a first annular, outlet nozzle a first, hollow, swirling, converging stream of liquid from the swirling liquid in the first, liquid swirling chamber from around and into a central portion of the path of, and in the direction of flow of, the particulate substance, so that the first, hollow, swirling converging stream of liquid is intimately contacted with the particulate substance, and

(e) spraying from a second annular, outlet nozzle a second, hollow, swirling, converging stream of liquid from the swirling liquid in the second, liquid swirling chamber,



from around and into the path of liquid from the first, hollow, swirling stream of liquid that has been intimately contacted with the particulate substance, and

(f) wherein the improvement comprises, the first hollow, swirling, converging stream of liquid is swirled in an opposite direction to the second, hollow, swirling, converging stream of liquid, whereby,

(g) discrete particles of the particulate substance that are intimately contacted with the first, hollow, swirling, converging stream of liquid and subjected to very high shear and are thoroughly wetted and scrubbed to partially dissolve an outer layer and reveal new fresh surfaces, and then liquid of the second, hollow swirling, converging stream of liquid is rapidly and intimately contacted with the newly formed, fresh surfaces on the discrete particles by subjecting the outer layer to very high shear thereby dispersing and further dissolving the outer layer.

4,218,013

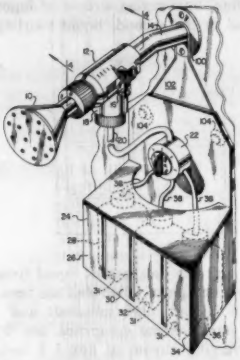
SHOWER HEAD FLUID DISPENSER

Charles A. Davison, P.O. Box 11005, Dallas, Tex. 75223

Filed Aug. 11, 1978, Ser. No. 932,798
Int. Cl.[2] B67D *5/38*
U.S. Cl. 239—74 **5 Claims**

1. An improved, portable shower head fluid dispenser for shower stalls and tub areas of the type including a shower spray nozzle disposed on the end of a fluid dispenser valve block removably coupled to a water supply pipe wherein select fluid such as soap is passed through the valve block in selected quantities to mix with the shower water at the selection of a person in the shower, wherein the improvement comprises a removable valve block having a flow channel formed therethrough with a lower portion of greater diameter than an upper portion and provided for passage of shower water therethrough, said valve block having a depending communication passage formed generally orthogonal to said flow channel and communicating with said flow channel in the area of the interface between said lower and upper portions wherein a selectable venturi draft will be imparted to said depending communication passage and wherein said valve block includes a venting channel extending outwardly from the flow channel, a stationary vent block having an aperture therethrough adapted to communicate with said venting channel, and a slide block having a plurality of apertures of varying diameter formed therethrough, said slide block mounted for

rectiliner movement parallel to said flow channel and vented to the atmosphere for select communication with said flow channel and selective control of said venturi draft, by varying the restrictions in said venting channel a fluid supply reservoir housing portably suspended beneath said shower head and supporting at least one fluid container, said housing including means for permitting visual observation of the fluid level in the container received therein and each container being connected in flow communication with said valve block through tubular members supplying the fluid to said valve block for discharge therefrom, said tubular members being in communication with said depending passage and one of said containers wherein a venturi draft will precipitate fluid flow therebetween, and a



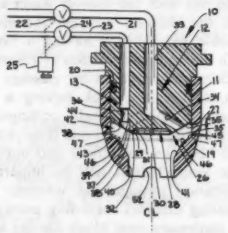
selector valve comprised of a ported shaft having apertures formed therethrough for opening, closing and channeling fluid flow therein, said shaft having a plurality of detent areas for rotational positioning in proper open and closed registration facilitating fluid flow operation in a shower stall area, said valve also including a selector dial of substantially enlarged surface area for facilitating valve selection by a person having wet hands and limited vision in the shower, and said valve being disposed between said valve block and said fluid supply housing and in communication with said tubular members between said valve block and said fluid supply housing for channeling the select fluid flow therebetween in response to said valve block.

4,218,014

MULTIPLE FLAVOR POST-MIX BEVERAGE DISPENSING HEAD

Gene A. Tracy, Amery, Wis., assignor to The Cornelius Company, Anoka, Minn.

Filed Feb. 21, 1979, Ser. No. 13,102
Int. Cl.³ B67D 5/56
U.S. Cl. 239—106 **34 Claims**



1. In an open chambered multiple flavor post-mix head for concurrent dispensing and mixing of a selected any one of a plurality of different flavored beverage concentrates and diluent, said head having a nozzle, a diluent outlet in the nozzle, a plurality of discrete concentrate outlets in the nozzle with there being one outlet for each concentrate, a spout under the nozzle for mixing together flows of diluent and a selected concentrate from a respective one of the concentrate outlets, and a downward extending opening out of the bottom of the spout for discharge of mixed beverage from the head; the improvement comprising:

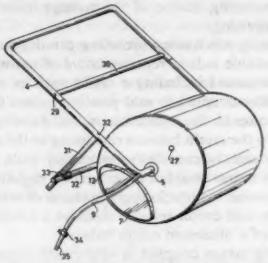
a downward facing open concavity centrally located in the nozzle bottom and within the spout, said concavity being centrally within and spaced from the discrete concentrate outlets, there being a sharp edge of intersection between the concavity and a nozzle bottom surface surrounding the concavity.

4,218,015

GARDEN ROLLER CAPABLE OF STORING AND DISPENSING LIQUIDS

Thomas Dean, "Lynwood", Hooten Rd., Willaston, Wirral, Cheshire, England

Filed Aug. 4, 1978, Ser. No. 930,893
Claims priority, application United Kingdom, Aug. 12, 1977, 33831/77; Nov. 19, 1977, 148230/77
Int. Cl.² B05B 9/00
U.S. Cl. 239—147 **7 Claims**



1. A garden roller for leveling and flattening the surface of the ground which is capable of storing, conveying and dispensing a liquid comprising:

a hollow, longitudinally extending cylindrical drum having opposed end walls, with one of said end walls having a closable opening therein for introducing a liquid into the interior of said drum;

a hollow tubular handle, pivotally connected to the opposed end walls of said drum along the longitudinal axis of rotation thereof, with one of said end walls of said drum further including a flow aperture disposed along the longitudinal axis of said drum and adapted to receive one end of said hollow handle, said flow aperture being in communication with the interior of said hollow drum;

means for dispensing the liquid from the interior of said drum, said dispensing means including a flexible conduit having an inlet portion disposed within said hollow drum and an outlet portion disposed exterior of said drum, said inlet portion having an open end, said conduit passing from the interior of said drum to the exterior thereof through said flow aperture and with at least a part of said outlet portion of said conduit being disposed within said hollow handle; and

sealing means for preventing the liquid inside said drum from passing through said flow aperture other than through said conduit, and with the length of said inlet portion of said conduit being at least as long as the length of the radius of said drum and with the open end of said inlet portion of said conduit being provided with a weight whereby when said handle is pivoted to facilitate the conveyance of said roller, the open end of said inlet por-

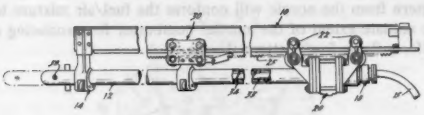
tion of said flexible conduit remains substantially in a vertically downward position adjacent the bottom of the drum, thereby enabling the entire contents of the drum to be dispensed.

4,218,016

LANCE TUBE CONSTRUCTION

Melvin A. Freund, Lancaster, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 26, 1978, Ser. No. 928,172
Int. Cl.[2] B05B *3/18*
U.S. Cl. 239—186 **6 Claims**



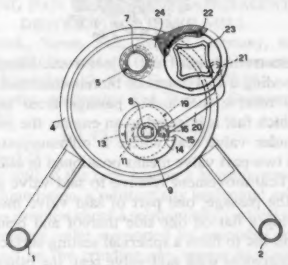
1. A lance tube for cleaning apparatus for boilers and the like, which apparatus is designed to project an aqueous liquid, comprising an elongated tube having an inlet end and a discharge end, discharge orifice means appurtenant to the discharge end thereof and through which tube liquid is adapted to be conducted for discharge through such orifice means, characterized by a filler tube extending longitudinally within the lance tube and comprising a sealed hollow enclosure, the filler tube being of lesser diameter than the lance tube and having a total weight less than the weight of water displaceable thereby, means being provided to space the filler tube from the internal wall of the lance tube, whereby liquid may flow between the lance tube and filler tube for discharge through such orifice means.

4,218,017

OSCILLABLE SPRINKLER FOR CULTIVATED PLOTS, SUCH AS FIELDS, MEADOWS, GARDENS AND THE LIKE

Roman Gianfranco, Pasiano, Italy, assignor to Claber S.p.A., Fiume Veneto, Italy

Filed Sep. 20, 1978, Ser. No. 944,138
Int. Cl.[2] B05B *3/16*
U.S. Cl. 239—242 **2 Claims**



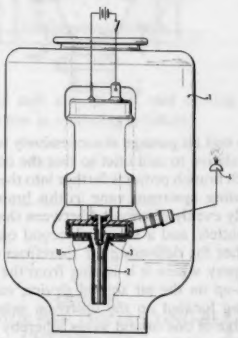
1. An oscillable sprinkler for cultivated plots such as fields, meadows, gardens, comprising a tubular oscillable arm closed at one end and having a plurality of radial holes distributed along its length, means for feeding water to the interior of said oscillable arm through the other end thereof, a drive shaft rotated continuously about its axis and a crank-and-connecting-rod assembly arranged for connecting said drive shaft to said oscillable arm for converting the continuous rotary motion of said shaft into a reciprocal swinging motion of the arm, said assembly having the crank fastened to the oscillable arm and the connecting rod arranged with said one end pivoted to said crank and the other end likably connected to the drive shaft, characterized in that said other end of the connecting rod is pivoted to a cam follower inserted slidably in a guide track formed radially on a disc carried by said drive shaft and rotated in unison therewith, said cam follower being engaged by a fixed cam having a substantially oval profile arranged coaxially with said drive shaft and so oriented that the engagement of the follower with the cam ends substantially corresponds to the arrival of the swinging arm at the dead centers of its reciprocal swinging motion.

4,218,018

ARRANGEMENT FOR WASHING LENSES OF HEADLIGHTS

Horst Seibicke, Bühl-Altschweiert, and Eckhard Ursel, Bühl, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,235
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735508
Int. Cl.[3] B60S *1/46*
U.S. Cl. 239—284 A **10 Claims**



1. An arrangement for washing lenses of headlights comprising a source of washing liquid; conveying means communicating with said source and arranged for flowing said washing liquid therethrough, said conveying means including a supply conduit; a nozzle communicating with said conveying means and arranged for admitting said washing liquid from the latter and issuing the same toward the lens to be washed; and a rotary pump communicating with said conveying means and operative for inducing said washing liquid to flow from said source to said nozzle through said conveying means, said pump having a chamber into which said supply conduit is open and a rotor having a projecting portion which extends into said supply conduit, said rotor having a plurality of blades which are circumferentially spaced from one another so that a plurality of gaps are formed each between two adjacent blades, and a plurality of ribs which are arranged on said projecting portion of said rotor, each of said ribs extending into a respective one of said gaps between two adjacent blades and being circumferentially spaced from the latter.

4,218,019

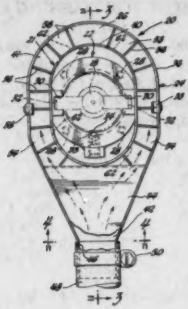
AIR SHROUD DEVICE FOR PAINT SPRAY GUNS

Jack W. Baldwin, Royal Oak, and Jonathon D. Carlson, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1979, Ser. No. 66,806
Int. Cl.[3] B05B *7/08*
U.S. Cl. 239—290 **2 Claims**

1. In combination with a paint spray gun having a spray nozzle, an air shroud device adapted to be received about the nozzle and detachably fixed to the gun for delivering a shroud

of air about paint spray issuing from the nozzle, said air shroud device comprising an annular air passage extending about the nozzle, an inlet for delivering air in opposite directions therefrom into semi-annular branches of said air passage, a series of first outlets spaced along said branches for delivering air therefrom in the same direction as and about paint spray issuing from the nozzle, said first outlets formed in part by a series of vanes which are spaced along and extend transversely of said branches and have entrance edges which project at varying distances into said air passage, said entrance edges of said vanes in each of said branches projecting progressively longer distances into said air passage at successively further downstream locations relative to said inlet so that the entrance edge of the vane in each branch projects further into the oncoming air than the preceeding upstream vane in this branch whereby air is substantially evenly distributed between the vanes and thus to said first outlets, and a series of second outlets spaced along said branches for delivering air therefrom toward and about the paint spray where it is issuing from the nozzle to prevent paint build-up on the air shroud device, each of said second outlets being located on the upstream side and adjacent the entrance edge of one of said vanes whereby air is substantially evenly distributed between said second outlets.



4,218,020

ELLIPTICAL AIRBLAST NOZZLE

Samuel B. Reider, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1979, Ser. No. 14,709
Int. Cl.[2] B05B *1/04, 7/00*
U.S. Cl. 239—406 **1 Claim**

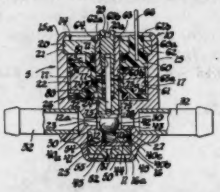
1. An airblast nozzle for an annular combustor comprising: an air supply ring including an air inlet end for receiving compressed air from an air supply compressor and a nozzle outlet end, a fuel supply tube located concentrically of and coaxially along the air supply ring and including a plurality of fuel spray orifices, means defining a mixing swirl chamber upstream of said nozzle outlet end and downstream of said orifices to receive fuel therefrom, a plurality of air swirler vanes located in surrounding relationship to said fuel supply tube at a point upstream of said fuel spray orifices for producing an air swirl of progressive radius within said swirl chamber for mixing air and fuel therein, said nozzle outlet end having a pair of undercut slots therein extending along generally greater radius lines than the inside diameter of said nozzle outlet end and operative to produce a plurality of radial vortices along both of said slots operative upon the swirl pattern to produce a flared wide angle spray cone issuing from said nozzle outlet end to define a major axis of a distribution pattern within an annular combustor, and said nozzle outlet end having side portions thereon with a radius corresponding to that of the inside diameter at the swirl chamber to produce a reduced width fuel/air flow from the nozzle defining a minor axis of an elliptically configured fuel-/air flow pattern into the annular combustor wherein the spray pattern from the nozzle will conform the fuel/air mixture to the arcuate extent of the annular combustor for producing a uniform flame front pattern therein.

4,218,021

ELECTROMAGNETIC FUEL INJECTOR

James D. Palma, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 838,468, Oct. 3, 1977, abandoned. This application Sep. 13, 1978, Ser. No. 941,754
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—585 **15 Claims**



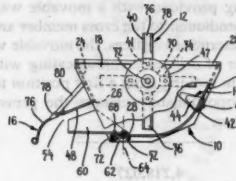
1. An electromagnetic fuel injector including a housing means providing a fuel chamber therein intermediate its ends adapted to receive fuel and a passage from said chamber through which fuel is injected to an engine, the passage defining an annular valve seat where it communicates with the chamber; a two-part valve means positioned in said fuel chamber for vertical movement relative to said valve seat to open and close the passage; one part of said valve means being a sphere having a flat on one side thereof and being spherical opposite said flat to form a spherical seating surface for valve-closing engagement with said valve seat; the other part being an armature with a flat end face seating against the flat surface of the sphere in a laterally slidable engagement; a valve-closing spring positioned to act on said armature in a direction moving said armature to effect movement of said valve means to its closed position with the sphere part in seating engagement with said valve seat and, a valve-opening spring disposed in said passage and bearing against the sphere in a valve-opening direction to bias said valve means in an opening direction relative to said valve seat and to maintain said flat in abutment against said flat end face in centered position thereon relative to said valve seat during continued opening and closing movement of said valve means relative to said valve seat.

4,218,022

STRAW CHOPPER AND SPREADER ATTACHMENT FOR A COMBINE HARVESTER

Ernst Boehm, Dingolfing, and Heinz Eder, Aufhausen, both of Fed. Rep. of Germany, assignors to Gebr. Eicher G.m.b.H., Isar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 957,114, Nov. 2, 1978, abandoned. This application Mar. 28, 1979, Ser. No. 24,755
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, 2749046
Int. Cl.[2] B02C *18/22*
U.S. Cl. 241—101.7 6 Claims



1. A straw chopper and spreader attachment for an agricultural combine including a chopper housing, a rotatable chopper drum rotatably mounted within the chopper housing, an array of blades mounted on the rotatable chopper drum, an array of stationary cutter blades mounted within the chopper housing in cooperative relationship with the array of blades mounted on the rotatable chopper drum, and a spreader assembly secured to the chopper housing, the spreader assembly including upper and lower transverse plates which form a convergent duct for the passage of air and chopped straw and a plurality of guide vanes mounted within the convergent duct, each of said guide vanes including a substantially vertical section and a generally horizontal flange which cooperates with one of said transverse plates to form a portion of one wall of the convergent duct.

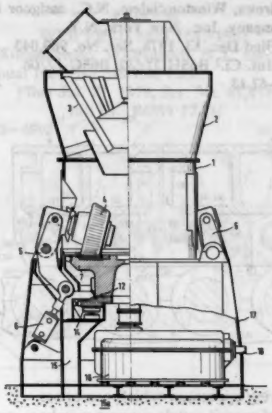
4,218,023

GRINDING PAN BEARING ARRANGEMENT AND DRIVE OF A ROLLER MILL

Horst Brundiek, Neuss, Fed. Rep. of Germany, assignor to Loesche GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 17, 1978, Ser. No. 870,092
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703535
Int. Cl.[2] B02C *15/00*
U.S. Cl. 241—121 7 Claims

1. A roller mill of the type having a housing structure supported on a foundation, a substantially horizontal grinding pan supported for rotation about a substantially vertical mill axis, at least one grinding roller supported by pivotable journals for rolling contact on the grinding pan, means to pivot the rotational axis of the roller to move the roller into and out of engagement with the grinding pan, and driving means below the grinding pan to rotate the grinding pan, comprising, the grinding pan having a horizontal pan section and an integral substantially vertical depending section, a support ring in contact with the lower end of said depending section and having a larger diameter than said depending section to extend radially therebeyond, at least three hydrostatic bearings symmetrically arranged for supporting said support ring at said radially extending location for coaxial rotation with said grinding pan, each bearing being adjustably mounted on a base support element of the housing structure so that they distribute the entire load of the grinding operation through the grinding pan, support ring, and base support elements to the foundation, said base support elements being radially outwardly spaced



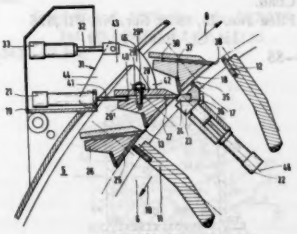
with respect to said mill axis so that said driving means is readily accessible when in operating position.

4,218,024

ADJUSTING DEVICE FOR THE CUTTING BLADES OF A CUTTING TOOL

Wilhelm Pallmann, Zweibrücken, Fed. Rep. of Germany, assignor to Pallmann KG Maschinenfabrik, Zweibrücken, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,615
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2755000
Int. Cl.[2] B02C *13/26*
U.S. Cl. 241—188 R 17 Claims

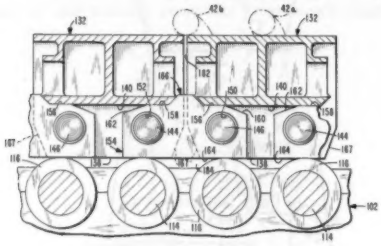


1. An adjusting device including a housing with cutting blades of a cutting tool having a cutting blade ring carrying the cutting blades rotatably arranged in the housing and also provided with wear elements, the improvement in combination therewith which comprises: at least one abutment associated with the cutting blades to be adjusted and adjustable so as to be adapted in comformity with the wear of said wear elements, and at least one setting device for adjusting the cutting blades of the cutting tool so that they will abut said at least one abutment.

4,218,025
CONVEYING APPARATUS HAVING LOAD-BEARING CONNECTING LINKS

Edwin T. Andrews, Winston-Salem, N.C., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,043
Int. Cl.[3] B65H *51/20*; B65G *17/06*
U.S. Cl. 242—47.13 **12 Claims**

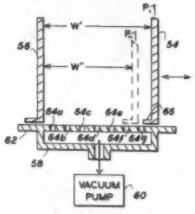


1. A conveying apparatus, which comprises:
a plurality of spaced article-support members, each of said article-support members having a planar undersurface;
a frame;
a plurality of spaced supporting surfaces mounted on said frame for supporting said article-support members for movement, said spaced supporting surfaces positioned to engage said planar undersurfaces of said article-support members;
means for connecting adjacent pairs of said article-support members;
means extending between adjacent article-support members and having surfaces in planar alignment with the undersurfaces of said article-support members for engaging the spaced supporting surfaces to provide a continuous planar surface with the undersurfaces of said article-support members at least when the article-support members are supported on the spaced supporting surfaces; and
means for moving said article-support members relative to said supporting surfaces.

4,218,026
PAPER WEB BUFFER SYSTEM

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 23, 1978, Ser. No. 918,615
Int. Cl.[2] B65H *23/24*
U.S. Cl. 242—55 **2 Claims**

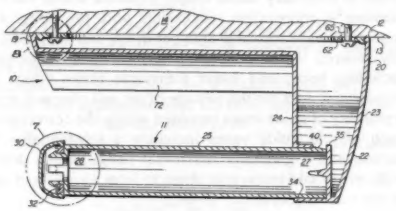


1. Paper handling apparatus comprising
a reel,
a supply of paper web supported by the reel,
a processor for operating on the paper web,
a motor operable to drive the reel to move the paper web from the reel to the processor,
intermediate rollers supporting the paper between the reel and the processor, and
a paper web buffer system, the buffer system comprising
a housing defining a vacuum chamber, one of the walls of the housing being a cross member in communication with the pressure reducing source, the cross member being provided with a plurality of orifices,
a pressure reducing source and
a portion of the paper web being disposed adjacent the vacuum chamber, the vacuum chamber and pressure reducing source being operable to create a pressure differential across said portion of the paper web and to draw said portion into a loop in the chamber,
the housing being provided with a movable wall disposed generally perpendicular to the cross member and slidingly engaging predetermined orifices, the movable wall changing the number of orifices communicating with the vacuum chamber in moving from a first position to a second position to proportionately change the pressure in the vacuum chamber.

4,218,027
DISPENSER FOR PAPER ROLL

Dan L. Pool, 5524 N. 39th Ave., Phoenix, Ariz. 85019

Filed Dec. 26, 1978, Ser. No. 972,691
Int. Cl.[2] A47L *10/32*
U.S. Cl. 242—55.2 **8 Claims**



1. A dispenser for attachment to a selected surface for holding a roll of coiled paper sheet material having a hollow core, said dispenser comprising:
a. a base having a back side for placement against said surface and a front side;
b. attachment means for securing said base to said surface;
c. a pedestal projecting from the front side of said base;
d. a spindle having a substantially constant diameter receivable through the core in said roll and having a fixed end affixed to said pedestal and a free end;
e. a cap having a diameter slightly greater than the diameter of the spindle rotatably carried at the free end of said spindle and having a projection extending radially therefrom for retaining said roll upon said spindle said projection having a width less than the diameter of said cap; and
f. detent means interacting between said spindle and said cap for retaining said projection at predetermined angular positions relative to the spindle.

4,218,028
BRACKET FOR SUPPORTING A ROLL OF MATERIAL

Jay W. Pickens, Fort Worth, Tex., assignor to D/FW Plastics, Bedford, Tex.

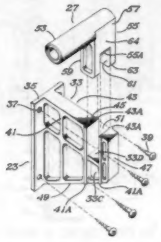
Filed Aug. 27, 1979, Ser. No. 69,635
Int. Cl.[3] A47K *10/22*
U.S. Cl. 242—55.2 **5 Claims**

1. A bracket for rotatably holding a roll of material of the type having an axial opening formed in opposite ends, comprising:
two support members adapted to be secured to support structure at spaced apart positions,

each support member comprising a body having a slot formed therein from one side to an opposite side,

two shaft means each adapted to be removably coupled to one of said support members for supporting a roll of material for rotation between said two support members,

each shaft means comprising a shaft portion adapted to be inserted into the axial opening at one end of the roll of material and a coupling portion for coupling the shaft means to one of said support members such that the shaft means extends transversely with respect to the support member,



said coupling portion of each shaft means having a slot formed therein from one side to an opposite side,

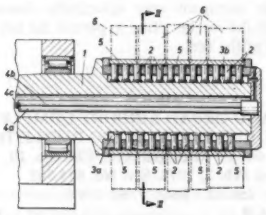
a portion of the coupling portion of each shaft means being adapted to be removably received in the slot of the body of one of the said support members and a portion of the body of the corresponding support member being adapted to be removably received in the slot of the coupling portion of the shaft means whereby the shaft means may be removably interlocked with the support member.

4,218,029

UPCOILER

Werner Schwenzfeier, Leoben; Thomas Neff, St. Florian, and Karl Wiesbauer, St. Valentin, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 16, 1979, Ser. No. 67,052
Int. Cl.[2] B65H *19/04*
U.S. Cl. 242—56.9 **7 Claims**



1. An upcoiler, comprising

a drive shaft,

a winding drum, which consists of a plurality of axially aligned drum rings surrounding said shaft,

a plurality of pressure plungers, which are radially slidably mounted in said shaft and radially aligned with all said drum rings and spaced apart in the peripheral and axial directions of said shaft and arranged in groups disposed in respective sectors of said shaft, and

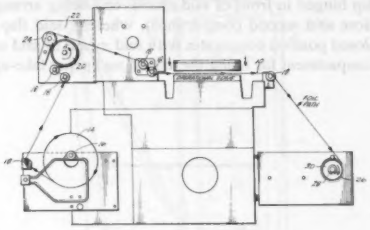
pressure-applying means for applying fluid pressure to said pressure plungers so as to urge them radially outwardly against said drum rings to hold the latter clear of said shaft, said pressure-applying means comprising a plurality of pressure fluid conduits for applying fluid pressure to respective groups of said pressure plungers.

4,218,030

WEB FEED MECHANISM

Eugene C. Korzeniewski, Willingboro, N.J., assignor to Avery International Inc., San Marino, Calif.

Filed Jul. 27, 1979, Ser. No. 61,478
Int. Cl.[2] B65H *17/02*
U.S. Cl. 242—67.2 **10 Claims**



1. A web feed mechanism having an adjustable intermittent drive for transferring the web from a supply roll, comprising:

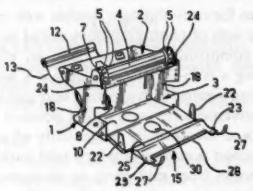
a first drive means engaging the web on one side of the operational zone, second drive means engaging the web at a position spaced from the first drive means on the other side of the operational zone, motor means applying torque to the first drive means in a direction to pull the web from the supply roll past the position of the second drive means and through the operational zone, means including a stepper motor controlling rotation of the second drive means, the stepper motor when energized locking the second means against rotation and preventing movement of the web by the first drive means and associated motor means, and control means for pulsing the stepper motor to advance the second roller in fixed angular increments, allowing the web to be advanced in fixed increments by the first drive means and associated motor means.

4,218,031

CHART BOX FOR THE STRIP CHART OF GRAPHICAL RECORDERS

Christian Camier, Amiens, and Francis Manier, Sains en Amienois, both of France, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 2, 1978, Ser. No. 947,875
Int. Cl.[2] B65H *17/02, 17/38*
U.S. Cl. 242—67.3 R **10 Claims**



1. A chart box for the strip chart of graphical recorders adapted to receive strip charts in form of folded paper or paper rolls, comprising

a support chassis,

a driving cylinder for the strip chart rotatably supported by said chassis,

a first compartment defined by said chassis for receiving a

blank strip chart, and including a pair of mutually perpendicular walls parallel to an axis of said cylinder,

a second compartment defined by said chassis for receiving a recorded strip chart and having a flat bottom for supporting a strip chart stack and means for supporting the axle of a paper take-up roll,

means arranged between the first compartment and said driving cylinder for applying the strip chart against said driving cylinder, said means between the first compartment and the driving cylinder being supported by said chassis and

a flap hinged in front of said chassis and being arranged to close said second compartment, whereby said flap in its closed position cooperates with said means of said second compartment for fixing the axle of said paper take-up roll.

4,218,032

APPARATUS FOR CONVOLUTING WEBS ONTO ROTARY CORES

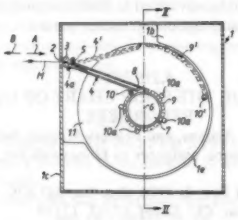
Erich Nagel, Anzing; Wolfgang Zahn, Munich; Heinz Kölbl, Munich; Horst Wildner, Munich; Ernst Ismann, Munich; Siegfried Bartel, Gauting; Ernst Biedermann, Taufkirchen, and Karl Dreher, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,623

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808445; Oct. 27, 1978, 2846952

Int. Cl.[2] G03B *1/04;* **B65H** *75/28*

U.S. Cl. 242—71.1 **30 Claims**



1. Apparatus for convoluting a flexible web, particularly for convoluting a web of photographic material in the interior of a container, comprising a rotary core; an elongated guide member having a web-admitting inlet and a web-discharging outlet; mounting means for supporting said guide member with freedom of movement between a first position in which said outlet is disposed substantially tangentially of said core and a plurality of second positions in which said outlet is located at different distances from said core; an elongated flexible link chin having first and second end portions, a first portion constituting one of said end portions and connected with said outlet and a second portion including the other of said end portions and at least partially surrounding said core in said first position of said outlet so that the leader of a web which is advanced through and beyond said outlet is coiled around said core within said link chain; a rotary flange consisting at least in part of magnetizable material and adjacent to one axial end of said core; and a magnet provided on said chain in the region of said other end portion and yieldably adhering to said flange.

4,218,033

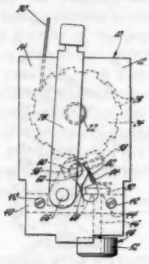
LOCKBAR RELEASE FOR INERTIA LOCKING SEAT BELT RETRACTOR

Bernard J. Finn, Troy; Charles B. Steger, Warren, and Kenneth H. Reid, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1979, Ser. No. 44,753

Int. Cl.[3] A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **3 Claims**



1. In a seat belt retractor having a belt reel journaled on a housing for belt winding and unwinding rotation, a ratchet plate carried by the reel, and a lockbar selectively movable between a locking position engaging the ratchet plate to lock the reel against belt unwinding rotation and an unlocking position disengaged from the ratchet plate to permit belt unwinding reel rotation, the improvement comprising:

support means mounting the lockbar for pivotal movement about a pivot axis between a locking position engaging the ratchet plate to lock the reel against belt unwinding rotation and an unlocking position disengaged from the ratchet plate to permit belt unwinding reel rotation;

means mounting the support means on the housing for movement from a normal position establishing the pivot axis of the lockbar in proximity with the ratchet plate for permitting selective movement of the lockbar between the locking position and unlocking position and a collapsed position withdrawing the pivot axis of the lockbar from proximity with the ratchet plate;

and operator actuatable means for moving the support means from the normal position to the collapsed position whereby the occupant may selectively disengage the lockbar from the ratchet plate to permit the belt unwinding rotation of the reel.

4,218,034

INDUSTRIAL AND URBAN AIRPORT COMPLEX WITH SPECIAL CARGO-HANDLING FACILITIES

John W. Magill, 664 N. Michigan Ave., Chicago, Ill. 60611

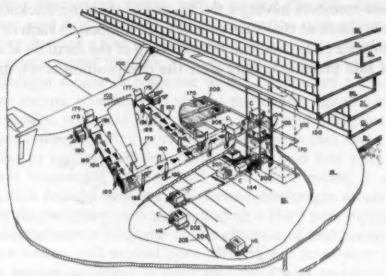
Filed Feb. 2, 1978, Ser. No. 874,502

Int. Cl.[2] B64F *1/32, 1/36*

U.S. Cl. 244—114 R **14 Claims**

8. An industrial and urban airport complex embodying a tract of land and including a system of aircraft landing and take-off runways surrounding and defining an aircraft loading and unloading apron, a multi-level passenger terminal located on said apron and including a ground floor level and an upper floor level, means defining a passenger and cargo gate at one side of said terminal and substantially at the level of said apron, a cargo down-elevator located at the gate and effective to transfer enplaning cargo items from said upper floor level to substantially the level of the apron for delivery to an aircraft on said apron and adjacent to the gate, an in-floor towline extending along said upper floor level in spaced relation with the gate and having associated therewith wheeled carts for carrying the cargo items, and means on said upper floor level of the passenger terminal for selectively transporting enplaning cargo items from the in-floor towline to the cargo down-eleva-

tor, said transporting means comprising a horizontal magazine of parallel side-by-side power roller conveyors extending between one side of the in-floor towline and the immediate vicinity of said cargo down-elevator, and a transfer device for each power roller conveyor of the magazine, positioned on the other side of said in-floor towline and adapted when operated



to slide cargo items from a cargo cart of the in-floor towline and in alignment with the associated power roller conveyor onto said associated conveyor for delivery by the latter to said first cargo down-elevator, said magazine of power roller conveyors and the associated transfer devices being laterally shiftable bodily in unison in order to bring a selected power roller conveyor into register with said cargo down-elevator.

4,218,035

SEMI-SUPINE AIRCREW EJECTION SEAT

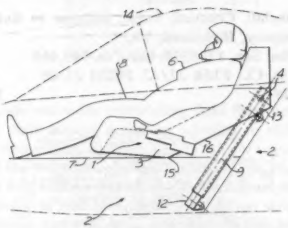
William I. D. Jordan, Surbiton, England, assignor to Hawker Siddeley Aviation Limited, Kingston-Upon-Thames, England

Filed Feb. 8, 1978, Ser. No. 876,028

Claims priority, application United Kingdom, Feb. 14, 1977, 6018/77

Int. Cl.[2] B64D *25/10*

U.S. Cl. 244—122 AC **2 Claims**



1. A semi-supine aircrew ejection seat, comprising an ejection gun to be installed extending in an upwardly and rearwardly inclined attitude with an inclination which is constant for all seat positions and having two telescopically-sliding parts a first of which remains anchored in the aircraft while the second leaves the aircraft in an upward and rearward direction on ejection, and a seat assembly having lower and upper portions which support the seat and back respectively of the user and the upper portion of which is connected by a pivotal connection to said second part of said ejection gun so as to be angularly movable relatively thereto, said upper seat portion, in the installed position, extending from said pivotal connection in a downward and forward direction away fron said gun at an acute angle thereto, whereby during the initial phase of ejection angular movement of the seat assembly about said pivotal connection as said second part of said ejection gun slides relatively to said first part automatically brings said lower portion of said seat assembly rearward towards said gun.

4,218,036

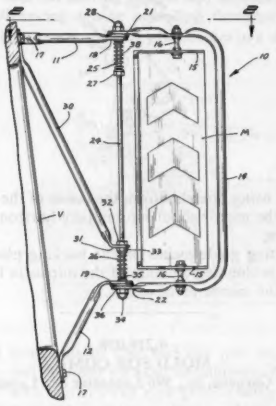
BRACKET FOR MOUNTING A REAR VIEW MIRROR ON A VEHICLE

Clarence O. Pitkanen, Minneapolis, Minn., assignor to Re-Trac Corporation, Minneapolis, Mich.

Filed Aug. 28, 1978, Ser. No. 937,333

Int. Cl.[3] B60R *1/06*

U.S. Cl. 248—475 B **1 Claim**



1. In a bracket for mounting a rear view mirror on a vehicle and having a support formed of tubular metal material adapted to be integrally connected to the vehicle body, and mirror holding frame also formed of tubular metal material and having a mirror mounted thereon and said support and frame having sections arranged in overlapping position and pivotally interconnected for adjustment of the frame and mirror between different positions about the pivot axis, the improvement which comprises,

(a) the said overlapping sections of the support and frame having flattened portions perpendicular to and surrounding the aperture axis,

(b) said flattened portions having facing series of circumferentially spaced ribs extending radially from the apertures,

(c) a washer member interposed between said flattened portions and about the pivot and having spaced ribs extending radially on both sides thereof adapted to interlock with the ribs on each of said portions, and

(d) the ribs on said flattened portions having varying lengths while the ribs on the washer are uniform and all at least as long as the longest ribs on the flattened portions.

4,218,037

REARVIEW MIRROR ASSEMBLY

Bruce F. Palamountain, Sunbury, Australia, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 18, 1979, Ser. No. 49,683

Int. Cl.[2] A47G *1/24*

U.S. Cl. 248—481 **10 Claims**

1. A rearview mirror assembly adapted to be mounted at a forward corner of a window frame in a vehicle door, comprising:

a mirror surface on a backing plate having an angularly related flange at one of its ends;

the backing plate and its flange being connected to each other by a hinge means;

a support frame encompassing the backing plate and having at one of its ends an angularly related flange having door window frame engageable means for positioning and retaining the mirror assembly on a vehicle door;

the backing plate flange and frame flange are contiguous to each other;

coacting ball and socket means on the support frame and the backing plate providing a pivot means about which the mirror is universally adjustable;

an adjusting lever mounted in the support frame flange and directly coupled to the backing plate flange;

the lever being operable from the inside of the vehicle door to tilt the mirror about substantially horizontal and vertical axes;

and coacting guide means on the backing plate and frame flange prohibiting rotation of the mirror in its own plane about the mirror pivot means.

4,218,038

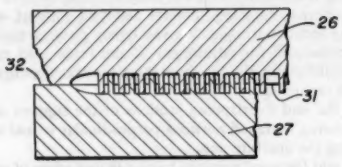
MOLD FOR COMB

Norman M. Garneau, Sr., 596 Lancaster St., Leominster, Mass. 01453

Filed Oct. 25, 1977, Ser. No. 844,718

Int. Cl.[2] **B29C** *1/00, 1/14;* **B29D** *19/02*

U.S. Cl. 249—160 **6 Claims**



1. Apparatus for molding a comb from plastic, comprising:

(a) a first mold half having a first flat surface onto which opens a cavity for an elongated comb back,

(b) a plurality of spaced walls perpendicular to the long direction of said cavity and protruding from the flat surface of the first mold half and having a space between each adjacent pair leading to the cavity, and

(c) a second mold half similar to the first mold half having a second flat surface into which enters a cavity which is the mirror image of the first-mentioned cavity and having spaced walls that protrude beyond said second flat surface and are spaced from and lie between adjacent walls of the first moid half when the flat surfaces are in engagement, the walls being of such a length that the outer edges engage the surface of the opposing cavity to form a seal therewith, the spaces between the walls of one mold half and adjacent walls of the other mold half defining comb teeth forming cavities.

4,218,039

CONCRETE FORM TIE

H. Gordon Gates, Denver, Colo., assignor to Gates & Sons, Inc., Denver, Colo.

Filed Feb. 1, 1979, Ser. No. 8,788

Int. Cl.[2] **E04G** *17/08*

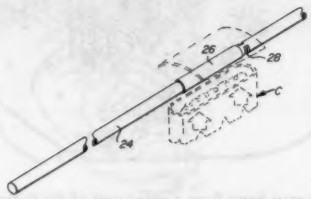
U.S. Cl. 249—214 **9 Claims**

1. A form tie for supporting a pair of spaced form panels which contain a settable composition therebetween, each form panel having a relatively small slot formed therein for receiving one end portion of the form tie therethrough, said form tie comprising:

an elongated shank insertable between the form panels;

a pair of form tie ends integrally connected to said shank for projecting outwardly of the form panels;

a pair of break members integral with said shank and located along said shank so as to be inwardly of the form panels, said members having a thickness less than the thickness of said shank so that a rotational force applied to each of said form tie ends results in the breaking of the form tie at each of said break members after the composition is set; and



a pair of hollow, heat shrinkable, solidly formed break back protective sleeves each having relatively thin side walls for contiguously surrounding and tightly engaging portions of said shank inwardly of the form panels, each of said break back protective members being positioned between one of said form tie ends and one of said break members and shrunk into place by heating so that after the composition between the form panels sets, said break members can be split and the form tie portions, including said break back protective sleeves, can be easily removed from the settable composition, the thickness of each of said break back protective members being substantially smaller than the thickness of the shank.

4,218,040

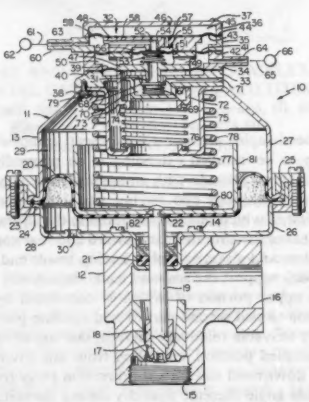
VALVE POSITIONER AND METHOD OF MAKING SAME

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sep. 12, 1978, Ser. No. 941,464

Int. Cl.[2] **F16K** *31/12;* **F02M** *25/06*

U.S. Cl. 251—28 **5 Claims**



1. In a self-contained valve positioner having a single valve positioner housing including an actuator portion having a pneumatically operated actuator means therein carrying a main

valve member to position said main valve member relative to a main valve seat in a valve unit in relation to the magnitudes of first and second pneumatic signals directed to said valve positioner and one of which is being utilized as the fluid source therein for pneumatically operating said actuator means, the improvement wherein said actuator means including a main flexible diaphragm means operatively interconnected to said main valve member, a first chamber formed between said main flexible diaphragm means and a second flexible diaphragm means, said first chamber in communication with either atmosphere through a first port means in said housing or said second pneumatic signal through a second port means in said second diaphragm means in response to the position of a first pilot valve means, wherein said second pneumatic signal is in communication with said first chamber when said first pilot valve means closes said first port means and opens said second port means to said second pneumatic signal, said first pilot valve means responsive to a second pilot valve means, a second chamber formed between said second diaphragm means and a third diaphragm means and including a third port means open to atmosphere in response to the position of said second pilot valve means, said second pilot valve means responsive to said first pneumatic signal to open said third port means to atmosphere, said first pilot valve means responsive to said second pilot valve means opening said third port means to open said second port means and close said first port means, wherein said second pneumatic signal communicates with said first chamber to bias said valve member to an open position against a biasing means biasing said valve member to a closed position.

4,218,041

LOW NOISE SLIDE VALVE

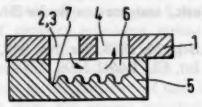
Georg Bernat, Menden, Fed. Rep. of Germany, assignor to IT & T Industries, Inc., New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,576

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658024

Int. Cl.³ F16K *11/06, 47/02*

U.S. Cl. 251—127 **5 Claims**



1. A slide valve for controlling fluid flow comprising:

a first plate having a surface adapted to slidably engage a corresponding apertured surface of a valve plate to control the mixture ratio and/or discharge volume of liquids said first surface including a flow channel recess having an opening in said first surface, a bottom wall opposite said opening, and side walls intermediate said bottom wall and said first surface, said bottom wall including pluralities of integrally formed elevations and depressions in the direction of fluid flow, each of said pluralities of integrally formed elevations being spaced substantially the same distance from said first surface.

4,218,042

BALL VALVE CONSTRUCTION

John D. Eckel, Hazelgreen, Wis., assignor to A. Y. McDonald Mfg. Co., Dubuque, Iowa

Filed Nov. 8, 1978, Ser. No. 958,649

Int. Cl.³ F16K *5/06*

U.S. Cl. 251—288 **1 Claim**

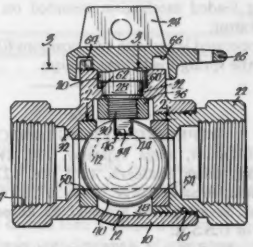
1. A ball valve comprising:

a valve housing having a fluid flow passage extending therethrough and terminating in ports for connection to a fluid conduit, said passage being intersected by an actuator opening in said housing and defining a valve chamber thereat, said opening having a shoulder intermediate its ends;

an actuator journalled in said opening and having a shaft including a threaded portion extending past said shoulder toward said chamber and terminating in a keyed type end having planar sides within said chamber;

a nut of smaller size than one of said ports threaded on said threaded portion after introduction into said chamber through said one port and retaining said actuator on said housing, said nut bearing against said shoulder;

a valve ball having a bore extending therethrough and a keyway type groove having planar sides in a side thereof,



said ball being smaller than said one port and being disposed in said chamber by axial introduction through said one port with said keyway type groove being oriented to slip fit about said keyed type end to couple said ball to said actuator for rotation thereby without restricting relative movement between said ball and said actuator along the axis of said rotation;

means for limiting rotation of said actuator relative to said housing to prevent loosening of said nut;

a fitting received in said one port for narrowing the same to a size less than said ball to prevent egress of said ball from said chamber; and

valve seats on sides of said chamber and about said ports.

4,218,043

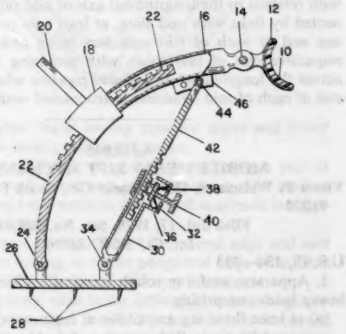
MANUAL AUTOMOBILE PUSHER

Francis E. LeVert, 1909 Matthew La., Knoxville, Tenn. 37919

Filed Feb. 9, 1979, Ser. No. 11,174

Int. Cl.³ B66F *1/04*

U.S. Cl. 254—35 **1 Claim**



1. A device for freeing automobiles from ice, snow or mud ruts, the device comprising:

a rubber cradle;

a metal cradle connected to the rubber cradle;

a curved hollow rectangular metal sleeve connected with

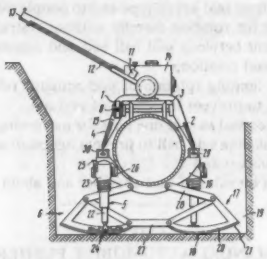
nonslippage contact to the metal cradle as by a smooth steel pivot pin;
a ratchet mechanism connected to the curved hollow rectangular metal sleeve;
a curved solid metal rack post with identical radius of curvature as said hollow rectangular metal sleeve designed to mate with the mechanism;
a metal rectangular base connected to the curved rack post by a smooth steel pivot pin;
a set of metal studs mounted on the metal rectangular base to prevent slippage;
a telescoping metal strut connected to both said metal rectangular base and to said hollow rectangular metal sleeve by a smooth steel pins;
a spring loaded mechanism mounted on said telescoping metal strut;
a hand operated lever with two positions to engage or disengage the spring loaded mechanism.

4,218,044

PIPELINE LIFTING DEVICE

Deviz F. Ikhsanov, ulitsa Tsjurupy, 110, kv.77; Vladimir L. Buzhinsky, ulitsa Shafeeva, 12/1, kv. 127; Konstantin E. Raschepkin, ulitsa R. Zorge, 37, kv. 67, all of Ufa, and Vasily K. Galjuk, Sevastopolsky prospekt, 83, korpus 2, kv. 37, Moscow, all of U.S.S.R.

Filed Nov. 6, 1978, Ser. No. 958,266
Int. Cl.[2] F16L *1/00*
U.S. Cl. 254—93 R **4 Claims**



1. A device for lifting a pipeline comprising: a frame carrying a self-propelled trolley installed with provision for moving along said pipeline; a sling embracing said pipeline; a supporting appliance in the form of two shoes arranged symmetrically with relation to the longitudinal axis of said pipeline and connected by links with said sling; at least two power cylinders, one end of each of said cylinders being articulated with a respective one of said shoes with provision for its turning across the longitudinal axis of said pipeline whereas the other end of each of said cylinders is articulated with said sling.

4,218,045

MOBILE HEAVY LIFT MECHANISM

Victor P. Weismann, 430 Prospect Cir., South Pasadena, Calif. 91030

Filed Jul. 17, 1978, Ser. No. 925,032
Int. Cl.[2] B66C *23/60*
U.S. Cl. 254—323 **19 Claims**

1. Apparatus useful in rough terrain for lifting and moving heavy loads comprising

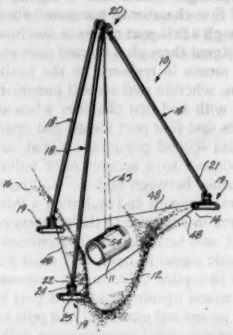
(a) at least three leg assemblies at least one of which is arranged for controlled variation of the length thereof while subjected to axial loading of the leg,

(b) power means associated with each variable-length leg assembly selectively operable for varying the length of the associated leg assembly under axial load thereof,

(c) a base unit for each leg assembly, each base unit including means cooperable with a lower end of a leg assembly for pivotally connecting the leg assembly to the base unit,

(d) a crown block assembly including means cooperable with an upper end of each of the leg assemblies for pivotally connecting the leg assemblies thereto, and

(e) winch means associated with one of the leg assemblies operable for reeling in and out a cable extendible there-



from via the crown block assembly to a load for lifting and lowering the load in an assembled state of the apparatus,

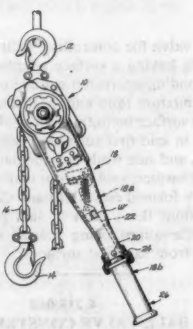
(f) whereby variation of the length of at least one of the leg assemblies while a load is suspended from the crown block produces controlled lateral movement of the crown block and resulting movement of the load within the area bounded by the base units and without movement of the base units.

4,218,046

SAFETY OVERLOAD INDICATING WINCH LEVER RESETTABLE LOCKOUT MEANS

Roy N. Bathum, Jr., Mercer Island, and Jerry L. Mallow, Kirkland, both of Wash., assignors to Beebe Bros., Inc., Seattle, Wash.

Filed Sep. 26, 1978, Ser. No. 945,829
Int. Cl.[2] B66D *1/00, 1/58*
U.S. Cl. 254—266 **5 Claims**



1. In combination with a manually operated winch including an articulated winch operating lever mounted on the winch to swing in an operating plane and comprising inner and outer elongated lever members, the inner member being operatively connected to the winch and the members being pivotally interconnected in general coalignment permitting the outer member to pivot in said plane relative to the inner member through an acute angle between limit positions, overload release spring means interconnecting the members adjacent the pivotal con-

nection therebetween and normally urging the outer member into a first such limit position while being yieldable in response to winch overload force exerted on the outer member to permit pivoting thereof into the second limit position, resettable safety lockout means carried by said operating lever in the vicinity of said pivotal connection including a first portion maintained in fixed position on one lever member and a second portion manually deflectable relative to said first portion under resilient stress from a lockout position into a reset position, means on the other lever member releasably engageable by said second portion to maintain the latter in its reset position with the outer lever member in its first limit position and to release said second portion for resilient return to its lockout position with movement of the outer lever member into its second limit position, said second portion of the safety lockout means in its lockout position physically obstructing return movement of the outer lever member to its first limit position.

4,218,047

JOINTURE APPARATUS FOR TENNIS SCREEN STRUCTURES

Gerald A. Douglas, Bettendorf, Iowa, assignor to Douglas Industries, Inc., Eldridge, Iowa

Filed Nov. 13, 1978, Ser. No. 959,968
Int. Cl.[2] E04H *17/00*; A63B *61/00*
U.S. Cl. 256—1 **3 Claims**

1. A jointure apparatus for use in supported tennis screen structures, said apparatus comprising:

at least one first means for holding screen structure being longitudinally elongated and having an attachment portion and a flap portion, said attachment portion including a cylindrical first bead portion and a first web strip attached to said first bead portion, said first web strip having a plurality of support receiving means formed therethrough, said flap portion being joined to said web strip, being U-shaped and including a pair of flaps, said flaps being connected at the juncture of said flap portion and said first web strip, the screen structure being secured between said flaps; and

second means for holding screen structure being longitudinally elongated and having at least one grasping means, said grasping means including a cylindrical second bead portion, a second web strip attached to said second bead portion, a longitudinal slot formed into said second bead portion opposite said second web strip, and a plurality of second support receiving means formed through said second web strip, said first bead portion being received by said second bead portion, said first web strip projecting through said longitudinal slot.

4,218,048

SUSPENDED GAS SHROUD APPARATUS

Michael J. Vanecek; John H. K. Piepenhagen; Michael J. Neale; Steven M. Lasiter, all of Beaumont, and Raymond A. Bailey, Port Neches, all of Tex., assignors to Georgetown Texas Steel Corp., Beaumont, Tex.

Filed Nov. 17, 1978, Ser. No. 961,597
Int. Cl.[3] C21C *5/42*
U.S. Cl. 266—236 **2 Claims**

1. In a tundish having at least one bottom-pour nozzle in its bottom wall, for teeming of molten metal therethrough, the improvement comprising:

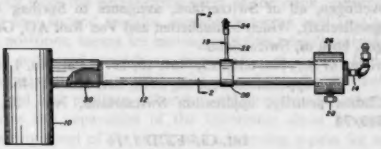
(a) means fixed to said tundish for engagement and disengagement of a shroud tube suspension apparatus therein and for journaling said suspension apparatus about a horizontal axis;

(b) a shroud tube suspension apparatus comprising:

(i) an axle for engagement in said journaling means;

(ii) a suspension arm normal to and depending from said axle, said suspension arm including means for rotation about its longitudinal axis;

(iii) said suspension arm carrying at its lower extremity a shroud tube support arm having at one end a shroud tube with a vertically oriented longitudinal axis, and at its other end a counterweight; and



(c) said shroud tube support arm comprising means communicating with a gas source and with said shroud tube for introducing a shrouding gas to the interior of said shroud tube; and

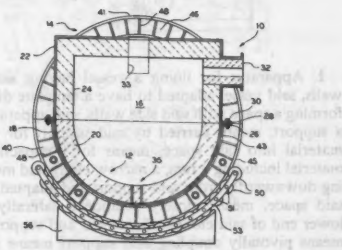
(d) whereby said shroud tube is adapted for rotational movement about the longitudinal axis of said suspension arm into and out of an operative position against the bottom of said tundish and encompassing said bottompour nozzle, said molten metal stream having substantially the same pouring path as the vertical axis of said shroud tube when in the operative position.

4,218,049

METALLURGICAL VESSEL

Eberhard G. Schempp, Pittsburgh, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jul. 17, 1978, Ser. No. 925,545
Int. Cl.[2] C21C *5/50*
U.S. Cl. 266—243 **9 Claims**



1. A metallurgical vessel having concave upper and lower sections joined to form a hollow chamber,

the inner surface of each of said sections having a pair of opposed, spaced apart end surfaces and a side surface connecting said end surfaces and which is arcuate in transverse cross-section,

said upper section having a lower peripheral edge and said lower section having an upper peripheral edge in registry with the peripheral edge of said upper section,

each said peripheral edge being defined by a pair of generally parallel side edges formed by the ends of said curved side surface and a pair of generally parallel end edges formed by said end surfaces,

said sections being releasably secured and arranged with the side edges of the upper section being disposed adjacent and substantially equal in length to the end edges of the lower section and the end edges of the upper section being

disposed adjacent and substantially equal in length to the side edges of the lower section,

tuyere means extending through the lower section of said vessel for injecting process fluids below the level of molten metal therein, and

means for rotating said vessel about an axis generally parallel to the axis of curvature of said lower section.

4,218,050

APPARATUS AND METHODS FOR AUTOMATICALLY LINING CONTAINERS, ESPECIALLY CASTING LADLES

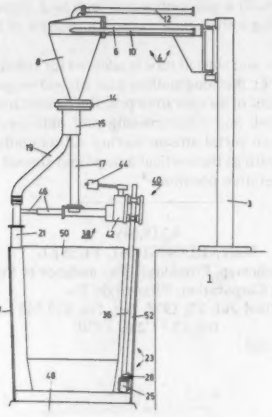
Ernst Egli, Dietikon; Nino Bombelli, Urdorf, and Max Misteli, Aetingen, all of Switzerland, assignors to Spribag Aktiengesellschaft, Widen-Mutschellen and Von Roll AG, Gerlafingen, both of, Switzerland

Division of Ser. No. 632,915, Nov. 18, 1975, Pat. No. 4,140,459. This application Sep. 18, 1978, Ser. No. 943,485

Claims priority, application Switzerland, Nov. 22, 1974, 15589/74

Int. Cl.[2] F27D *1/16*

U.S. Cl. 266—281 **6 Claims**



1. Apparatus for lining a vessel having side and bottom walls, said vessel adapted to have a template disposed therein forming a space with said side walls, said apparatus comprising a support, means carried by said support for pouring lining material into said space, means for compacting said lining material including a ram, a narrow elongated member depending downwardly from said support and adapted to extend into said space, means closely positioned laterally adjacent the lower end of said elongated member and supporting said ram, means pivotally coupling said support means and said elongated member one to the other adjacent the lower end of said elongated member, whereby said ram is pivotal about an axis generally transverse to the length of said elongated member.

4,218,051

WORKPIECE HOLDING FIXTURE

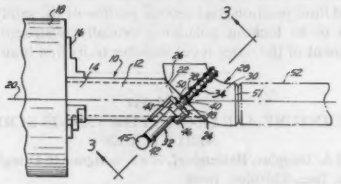
Joseph D. Stastny, 281 Ardmore Dr., Ferndale, Mich. 48220

Filed Nov. 13, 1978, Ser. No. 960,105

Int. Cl.[2] B25B *1/20*

U.S. Cl. 269—131 **16 Claims**

1. A holding fixture for mounting in a chucking member an irregularly shaped workpiece with a portion thereof on which an operation is to be effected disposed concentric to a predetermined axis of rotation corresponding to the normal axis of rotation of said chucking member, said holding fixture comprising a cylindrical member mounted in said chucking member and having an axis of rotation corresponding to the axis of rotation of said chucking member and a seating face on the end of said cylindrical member for engagement with a portion of the peripheral surface of said workpiece, said seating face being generally disposed in a plane forming an angle with said axis of rotation causing said portion of said workpiece on which an operation is to be effected to be aligned concentric with said axis of rotation, and means clamping said workpiece in position on said seating face, wherein said clamping means comprises a link chain hingedly attached at one end to a portion of said cylindrical member proximate said seating face, a male threaded member hingedly affixed to the other end of said link chain, a bracket fixedly attached to a portion of said cylindrical member proximate said seating face, an aperture in said



bracket for passing therethrough said male threaded member, and a female threaded member disposed on the other side of said bracket threadingly engaged on the end of the male threaded member. axis of rotation, and means clamping said workpiece in position on said seating face, wherein said clamping means comprises a strap hinged at one end to a portion of said cylindrical member proximate said seating face, a bracket fixedly attached to another portion of said cylindrical member proximate said seating face, an aperture in said bracket, a male threaded member hingedly mounted on the other end of said strap, and a female threaded member disposed on the other side of said bracket and threadably engageable with said male threaded member.

4,218,052

APPARATUS FOR FOLDING A SHEET OF MATERIAL AN ANGLE OF 180°

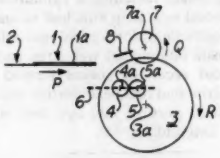
Arne I. Norén, Stockholm, Sweden, assignor to Nils Gustav Carlsson, Älvsjö, Sweden part interest

Filed Oct. 17, 1978, Ser. No. 952,083

Claims priority, application Sweden, Oct. 27, 1977, 7712117

Int. Cl.[2] B65H *45/16*

U.S. Cl. 270—71 **13 Claims**



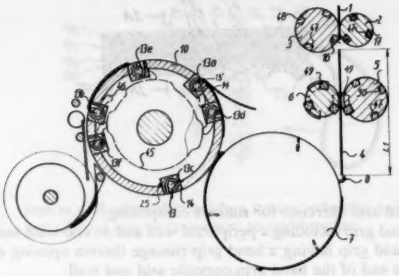
1. An apparatus for folding a sheet of material through an angle of 180° by conveying the material between a rotatable element provided with at least one blade and an element for receiving the material folded by said at least one blade wherein the element for receiving the material when folded by said at least one blade comprises two rollers which are moved at a speed substantially corresponding to the conveying speed of the material, the two rollers being coupled together and arranged to be placed in a circular arcuate path, wherein a plane oriented through the axes of rotation of the two rollers constantly maintains the same angular position relative to a fixed reference plane during movement of the two rollers along the arcuate path.

4,218,053

FOLDING APPARATUS FOR FOUR OR SIX ETCHINGS

Paul Heimlicher, Lugnorre, Switzerland, assignor to Maschinenfabrik Wifag, Switzerland

Filed Sep. 5, 1978, Ser. No. 939,226
Claims priority, application Sweden, Sep. 22, 1977, 7710645
Int. Cl.[2] B65H 45/16
U.S. Cl. 270—71 8 Claims



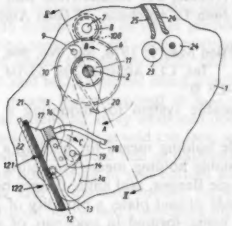
1. In a folding apparatus for a rotary printing press having a form cylinder with four or six etchings, a folding cylinder having a plurality of spaced folding jaw devices on the circumferences thereof, a collecting cylinder having folding blades cooperating with the devices on the folding cylinder, said devices operating to grip a portion of a piece of sheet material to form a fold therein, the improvement comprising, said devices divided into two groups, each group having respective different numbers of said devices and the ratio of the number of said devices in one group relative to the number of devices in the other group being a mixed number, and means provided in the folding cylinder for alternately rendering said devices of one group inoperative while operating the devices of said other group.

4,218,054

APPARATUS FOR FEEDING SHEETS TO IONOGRAPHY IMAGING CHAMBERS

Walter Bauer, Munich; Heinz Kröbel, Taufkirchen, and Jürgen Müller, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 866,036
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701201
Int. Cl.[2] B65H 3/46
U.S. Cl. 271—11 13 Claims



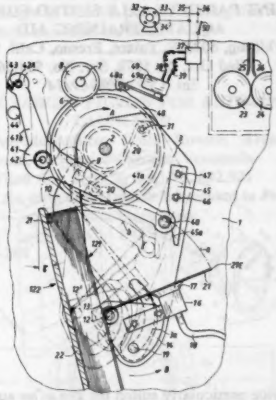
1. Apparatus for singularizing and transporting successive outermost sheets of a stack of overlapping sheets, particularly for feeding discrete sheets to the ionography imaging chamber of a radiographic system, comprising a support; a first transfer member mounted on said support and pivotable between first and second end positions, in which said first transfer member is respectively nearer to and more distant from the outermost sheet of the stack, through a first angle; a second transfer member; means for turnably mounting said second transfer member on said first transfer member for movement between a first position and a second position through a second angle which at least approximates said first angle; at least one sheet attracting member mounted on said second transfer member and being adjacent to and attracting a marginal portion of the outermost sheet of the stack in the first position of said second transfer member, said attracting member moving along an arcuate path away from the stack in response to movement of said second transfer member to said second position whereby the marginal portion of the outermost sheet is flexed in a direction away from the neighboring sheet of the stack; means for moving said second transfer member between said first and second positions; means for moving said first transfer member, together with said second transfer member, from said first to said second end position while said second transfer member is out of said first position, whereby said first transfer member completes the separation of the outermost sheet from the neighboring sheet of the stack; and advancing means for successive sheets of the stack, the marginal portion of the sheet which is engaged by said attracting member in said second end position of said first transfer member being located in the range of said advancing means.

4,218,055

APPARATUS FOR SINGULARIZING STACKED DIELECTRIC RECEPTOR SHEETS FOR LATENT IMAGES

Heinz Kröbel, Taufkirchen, and Walter Baur, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,275
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749687
Int. Cl.[2] B65H 3/08, 3/56
U.S. Cl. 271—106 8 Claims



1. Apparatus for singularizing and transporting successive outermost sheets of a stack of overlapping sheets having edge faces, particularly for feeding discrete sheets to the ionography imaging chamber of a radiographic system, comprising a support; a first transfer member mounted in said support and movable between first and second end positions in which said member is respectively nearer to and more distant from the outermost sheet of the stack; a second transfer member; means for turnably mounting said second member on said first member for movement between a first position and a second position; at least one sheet attracting member mounted on said second member and being adjacent to and attracting, in the first position of said first member, that portion of the outermost sheet of the stack which is spaced apart from the respective

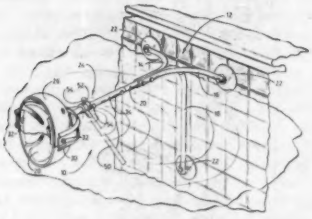
edge face, said attracting member moving along an arcuate path away from the stack in response to movement of said second member to said second position whereby said portion of the outermost sheet is flexed in a direction away from the neighboring sheet; means for moving said second member between said first and second positions; means for moving said first member, together with said second member, from said first to said second end position while said second member is out of said first position, whereby said first member completes separation of the outermost sheet from the neighboring sheet; a separating device located in the path of movement of successive outermost sheets between said portions and said edge faces of the respective sheets to flex such sheets while said second member moves relative to said first member and to thus promote the separation of outermost sheets from the neighboring sheets of the stack; and means for changing the position of said separating device with respect to the stack so as to maintain said device at a fixed distance from the edge faces of successive outermost sheets at least for the edge faces of the outermost and innermost sheets of the stack which move along discrete first and second arcuate paths in response to movement of said second member from the first to the second position thereof, said position changing means including a lever supporting said device and pivotable about an axis located in a plane disposed midway between two spaced apart points of the outermost sheet of the stack and normal to a line connecting said points, one of said points being located at a predetermined distance from said first arcuate path and the other of said points being located at the same distance from said second arcuate path.

4,218,056

RESTRAINT PARTICULARLY SUITED FOR USE AS AN AQUATIC TRAINING AID

Tom S. Whitling, 5023 E. Tulare, Fresno, Calif. 93727

Filed Oct. 25, 1978, Ser. No. 954,564
Int. Cl.[2] A63B *69/14*
U.S. Cl. 272—71 **10 Claims**



1. A device particularly suited for use as an aquatic training aid comprising:

A. a rigid base adapted to be affixed to a wall defining a pool and project therefrom along an axis lying in a plane substantially paralleling the surface plane of a body of water confined within the pool;

B. a socket adapted to receive in mated relation the head of a user applied therewith pressure sufficient to maintain said mated relation; and

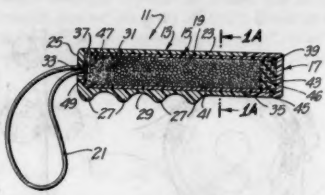
C. coupling means interconnecting said socket with said base including an elongated body interposed between the base and the socket, and means mounting said socket on said elongated body for oscillation of said socket with respect to said elongated body about a pair of normally related axes.

4,218,057

ARM EXERCISER FOR RUNNERS

Bradford W. Wilson, 1642-A Coriander, Costa Mesa, Calif. 92626

Filed Aug. 29, 1978, Ser. No. 938,095
Int. Cl.[3] A63B *21/00*
U.S. Cl. 272—117 **6 Claims**



4. An arm exerciser for runners comprising:

a hand grip including a peripheral wall and an end wall, said hand grip having a hand grip passage therein opening at an end of the hand grip opposite said end wall;

a tube having a tube passage therein and inner and outer ends;

said tube being received and retained in said hand grip passage with said inner end being in said hand grip passage;

a weight comprising metal in said tube passage to make the exerciser materially heavier;

closure means for closing the outer end of said tube; and

said outer end being out of said hand grip passage whereby the tube projects beyond the hand grip, said weight includes a plurality of weight elements, said hand grip being constructed of a resilient material and having a plurality of axially spaced radial projections on the exterior thereof to facilitate manual grasping of the hand grip, said tube being constructed of a rigid plastic material, said end wall having an aperture therein, said exerciser including a cord extending through said aperture with at least a portion of said cord lying outside of said hand grip and defining a loop sized to slip over the hand of the user, and means on said cord within said hand grip for cooperating with said end wall to prevent the cord from being withdrawn from the hand grip through said aperture.

4,218,058

ADJUSTABLE SYSTEM FOR MOUNTING A BASKETBALL GOAL

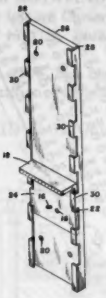
Robert A. Hilbert, 2616 Reckord Rd., Kingsville, Md. 21087; William F. Kohl, Jr., 620 Lake Dr., Towson, Md. 21204; Joseph M. Whelan, 249 Meadowvale Rd., Lutherville, Md. 21093, and John L. Apichella, 48 Glen Alpine Rd., Phoenix, Md. 21131

Filed May 9, 1978, Ser. No. 904,196
Int. Cl.[3] A63B *63/08, 63/04*
U.S. Cl. 273—1.5 R **4 Claims**

1. An adjustable system for mounting a basketball goal, comprising:

an adjustable holding means for holding a basketball goal, said adjustable holding means consisting of a plate and a pair of angle flanges, said angle flanges being located one on each side of said plate, a plurality of pairs of notched openings being formed in said pair of angle flanges to provide a plurality of pairs of inwardly directed angle flange lips, said adjustable holding means being attachable to a basketball back-board, and a bracket, said bracket being comprised of a normally horizontal portion and a downwardly directed normally vertical portion at a right angle thereto, said portions being so sized that the vertical portion slidably fits behind any pair of flange lips with the horizontal portion resting on the top edges thereof, and a pair of notches in said bracket of greater extent than the

length of any flange lip cut into the sides of said vertical portion, said bracket being mounted in any selected position in said adjustable holding means, whereby said basketball goal can be connected to said bracket.

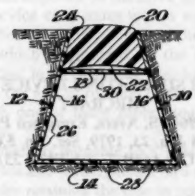


4,218,059

FIELD MARKER

Sidney W. Eiden, 103 Rockrose Dr., Meadowood, Newark, Del. 19711

Filed Jun. 23, 1978, Ser. No. 918,389
Int. Cl.³ A63B *19/06*
U.S. Cl. 273—25 **1 Claim**



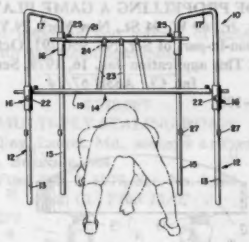
1. In an athletic field having a plurality of boundary and playing lines with the lines indicated by means of a plurality of visible markers, the improvement being each of said markers comprising a hollow elongated body member of substantially longer length than its width whereby an entire athletic field line is delineated by at least one of said markers, said body member being keystone shaped with a bottom wall and converging side walls extending upwardly away from said bottom wall, said body member being open at its top face with said side walls spaced from each other at said top face, a partition mounted within said body member spanning said side walls and dividing said body member into an upper portion and a lower portion, cushioning means in said upper portion of said body member disposed above and supported by said partition, said lower portion of said body member being a hollow chamber, said cushioning means being exposed at said top face, said cushioning means extending away from said bottom wall outwardly beyond said side walls at said top face, said cushioning means comprising an elongated pad of cushioning material, a plurality of drain holes being in said bottom wall and in said side walls below said cushioning means, further drain holes being in said partition below said cushioning means, said cushioning means having a clearly visible color on its surface exposed at said top wall whereby said body member may be mounted below the surface of a field with said exposed surface of said cushioning means disposed at at least ground level to thereby result in a line on the field delineated by said exposed surface of said cushioning means, said cushioning means being bowed upwardly transversely along its length thereof with the bottom surface of its central portion being spaced from said partition and with the longitudinal edges of said cushioning means being in contact with and resting on said partition, and said partition drain holes being in the general area of said central portion of said cushioning means where said cushioning means is bowed away from said partition.

4,218,060

FOOTBALL TRAINING DEVICE

Charles P. Forrest, 1306 St. Stephens Rd., Mobile, Ala. 36603

Continuation-in-part of Ser. No. 844,177, Oct. 21, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,635
Int. Cl.² A63B *67/00*
U.S. Cl. 273—55 R **4 Claims**



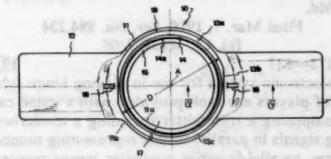
3. A football training device comprising first and second upright supporting members each including a pair of parallel vertical legs joined at their upper ends by a horizontal cross member, and a set of overhead frame units adjustably connected to said first and second upright supporting members to maintain said members in a longitudinally spaced relationship and form a running chute, said overhead frame units including a pair of parallel side bars and a plurality of parallel cross bars, said cross bars having means on at least one end thereof to vary the effective length thereof, whereby the said overhead frame units limit the height to which a person running thereunder and through the chute can raise his head.

4,218,061

REUSABLE TARGET PIGEON FOR AUTOLOADING LAUNCHER

Ludovico Lante-Montefeltro Della Rovere, Avenida Paez Quinta Ismenia, El Paraiso-Caracas, Venezuela

Filed Apr. 3, 1978, Ser. No. 892,921
The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.
Int. Cl.² F41J *9/16*
U.S. Cl. 273—364 **15 Claims**



1. A target pigeon comprising:
a substantially circular ring centered on a ring axis and having a substantially circular and continuous inner periphery defining a substantially circular and completely open space adapted to receive a launch tip of a launch-head and a substantially circular outer periphery;
a plurality of substantially angularly equispaced radially extending vanes tipped propeller-fashion;
a cup-shaped witness cap having a substantially circular rim

centered on a cap axis and having an axially directed end engageable with said ring between said peripheries thereof and an opposite axially directed end, and an end plate extending across and closing said rim at said opposite end thereof; and

means including interengaging formations on said rim and on said ring for releasably securing same together with said axes aligned and said one end of said rim bearing on said ring between said peripheries thereof and for freeing said cap and ring from each other when said cap is impacted.

4,218,062

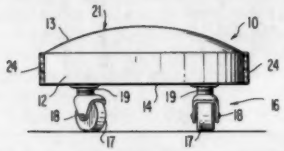
METHOD OF PROPELLING A GAME PLAYING PIECE

Clyde Brooks, Jr., 49 W. 94 St., New York, N.Y. 10025

Continuation-in-part of Ser. No. 950,791, Oct. 12, 1978, abandoned. This application Jan. 16, 1979, Ser. No. 4,005

Int. Cl.³ A63B *67/14*

U.S. Cl. 273—108 **3 Claims**



1. A method of an individual utilizing a rollable game playing piece comprising a substantially circular rigid body disc with a hemispheric friction upper portion and supporting rolling means on the bottom portion, said method comprising the steps of

(a) providing a playing area with a hard substantially planar non-slippery horizontal surface over which the playing piece is adapted to roll, with a net provided on said playing area,

(b) engaging the top friction surface of the rigid body disc with one of the individual's feet, and

(c) propelling the playing piece toward the net, rolling on the horizontal surface, by movement of the individual's leg whose foot is in engagement with the friction top portion of the body disc by flexing of the leg at the knee and/or hip and applying a force to the playing piece, and removing the foot from the playing piece after the force application.

4,218,063

ELECTRONIC SYSTEM FOR PLAYING BINGO

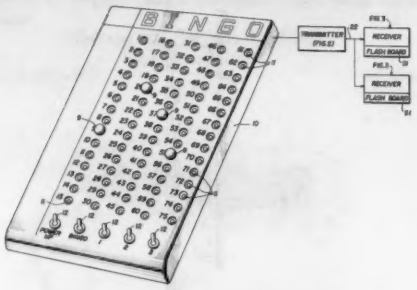
Gary D. Cooper, College Park, and Ronald D. Brigman, Huntingtown, both of Md., assignors to G.L.S. Partnership, College Park, Md.

Filed Mar. 7, 1978, Ser. No. 884,234

Int. Cl.³ A63F *3/06*

U.S. Cl. 273—237 **19 Claims**

1. An electronic system for use in playing bingo wherein a plurality of players are each provided with a game card, the system comprising a transmitter including a masterboard for delivering signals in parallel format representing numbers in a bingo game, parallel-to series converter means responsive to the output of said masterboard for converting the signals in parallel format into signals in series format, and means for sending signals in a single train of pulses in series format to at least one location, and at least one receiver at said one location including series-to-parallel converter means responsive to signals received for converting said signals in series format to signals in parallel format representing the numbers in a bingo game, a flashboard having numerical indicia thereon representing said bingo game numbers, said flashboard being disposed for view by said plurality of players, means on said flashboard for visually activating said numbers on said flashboard, means for connecting said visually activating means to said series-to-parallel converter means whereby said visually activating



means is responsive to signals from said series-to-parallel converter means for visually activating the numbers of a bingo game on said flashboard.

4,218,064

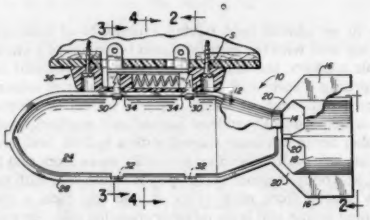
AERIAL BOMB SIMULATING DEVICE FOR MODEL AIRCRAFT

Donald A. Sobbe, 9641 S. Avers, Evergreen Park, Ill. 60642

Filed Jan. 23, 1979, Ser. No. 5,686

Int. Cl.³ A63B *71/02;* **F42B** *25/18*

U.S. Cl. 273—428 **1 Claim**

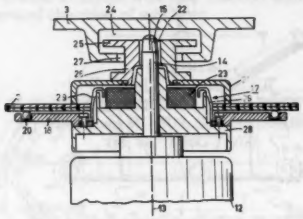


1. In a re-usable aerial bomb simulating device having a hollow, break-apart main body portion fillable with powder for dispersal in a cloud upon impact of the device after having been dropped from a model aircraft equipped with a bomb carriage and release mechanism, the improvement wherein said body portion comprises first and second interengagable body forming sections having matingly engageable circumambient edge regions, one of said sections having means defining a pair of shackles adjacent the edge region portion thereof for releasable engagement with the bomb carriage and release mechanism whereby only said one of said sections if directly supported thereby, means along said edge regions for providing a circumambient lap joint when said edge regions are in mating engagement, and a plurality of snap-in fingers integral of said edge regions engageable with corresponding recess areas of the opposing section for jointly with said lap joint affording interlock connection of said sections.

4,218,065
ARRANGEMENT FOR CENTERING, ALIGNING AND RETAINING A ROTATING RECORD

Willem van der Hoek, and Eduard Camerik, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,603
Claims priority, application Netherlands, Jun. 5, 1978, 7806072
Int. Cl.[2] G01D *15/32*; G01B *25/04*
U.S. Cl. 274—9 R 8 Claims



1. An improved arrangement for centering, aligning and retaining a rotary disc-shaped rigid record with a central disc hole in an operating position, the arrangement comprising:

a drive spindle with a free end, which spindle is rotatable about an axis of rotation,

a centering device disposed on the drive spindle near its free end, which device cooperates with a wall of the central disc hole in the operating position of the disc,

a disc aligner which is mounted on the drive spindle for aligning the disc in its operating position in a plane perpendicular to the axis of rotation of the drive spindle and provided with one or more supporting surfaces for the disc, as well as

a disc loader which is movable to a position opposite the centering device and which presses on a disc in the operating position, for retaining the disc in position in conjunction with the supporting surfaces of the disc aligner, the improvement being characterized in that

the disc aligner is rigidly connected to the drive spindle,

the centering device comprises a plurality of centering members which are radially movable between a rest position and an operating position which is situated nearer the axis of rotation, and

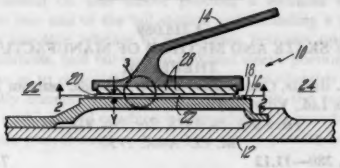
there are provided resilient means for urging the centering members towards their rest positions, the centering members being movable against the action of the resilient means solely by cooperation with the wall of the disc hole when the disc is placed onto the drive spindle and axially moved toward its operating position.

4,218,066
ROTARY SEAL

William Ackermann, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,424
Int. Cl.[3] F16J *15/44*
U.S. Cl. 277—53 16 Claims

1. In combination with the rotor and stator assemblies of a rotary machine, a seal structure for impeding the leakage of a gaseous medium between said assemblies wherein said structure comprises a cylindrical seal land extending from the rotor assembly and a cylindrical honeycomb faced land extending from the stator assembly into close proximity with the seal land of the rotor assembly forming, therewith, an annular channel separating the rotor and stator assemblies of the machine, said honeycomb material having a multiplicity of cells which are canted in the upstream direction with respect to the anticipated direction of flow through the channel during operation of the machine to encourage the generation of local vortices within

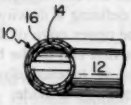


the channel for impeding said leakage of gaseous medium between the rotor and stator assemblies.

4,218,067
MULTI-PLY SEALING RINGS

Horace P. Halling, Laurel, Md., assignor to Pressure Science Incorporated, Beltsville, Md.

Filed Feb. 2, 1979, Ser. No. 8,856
Int. Cl.[2] F16J *15/02*
U.S. Cl. 277—205 11 Claims

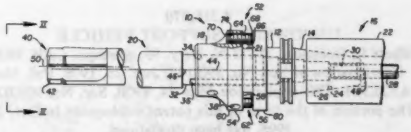


1. A resiliently deformable metallic annular sealing ring comprising an inner element and an adjacent concentric element, each of said elements having a radial cross sectional shape comprising a curvilinear member which encompasses at least a portion of a circle and which terminates in two end portions which are free to move relative to each other, the inner element being at least partially encased by the adjacent concentric element, the midpoint between the two end portions of the cross sectional shape of the inner element being located opposite the midpoint between the two end portions of the cross sectional shape of the adjacent concentric element.

4,218,068
DEFLECTABLE HOLDING ASSEMBLY

Karl T. Lutz, Gardner, and John L. Shepard, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 26, 1978, Ser. No. 4,792
Int. Cl.[2] B23B *31/00, 29/00*
U.S. Cl. 279—1 L 8 Claims



1. In a holding assembly (10) for connecting a shaft (20) to a drive means (16), said assembly having a body (12), said body having a first end portion (14) connectable to the drive means (16), a second end portion (18) connectable to the shaft (20) and a middle portion (21), the improvement comprising:

first and second spaced apart flanges (54,56) extending outwardly from the middle portion (21) of the body (12), said body being a unitary piece; and

means (62) for controllably urging the flanges (54,56) and controllably deflecting the middle portion (21) of body

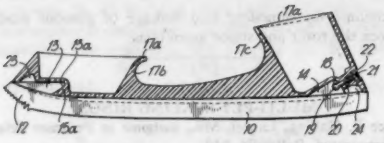
(12) and moving the second end portion (18) of said body (12) to preselected relative positions in response to deflection of said middle portion (21).

4,218,069

ICE SKATE AND METHOD OF MANUFACTURE THEREFOR

Hugh E. Baikie, Chateauguay Center, Canada, assignor to Tuuk Sports Ltd., Ville St. Laurent, Canada

Filed Jul. 26, 1978, Ser. No. 928,081
Int. Cl.[2] A63C 1/30
U.S. Cl. 280—11.12 **7 Claims**



2. An ice skate comprising
(a) an elongated blade having an ice-engaging edge and an upper edge opposite the ice-engaging edge;
(b) a superstructure defining a downwardly facing groove firmly engaging the upper edge of the blade;
(c) a lug secured to a first end of the blade to project from said upper edge in an upward direction and in a first longitudinal direction of the blade;
(d) a slot in a first end of the superstructure for receiving said lug upon entry of the blade when inserted into the groove upwardly and in said first longitudinal direction, said slot including a surface engaging the lug to prevent downward withdrawal of the blade from the groove while permitting such withdrawal in the longitudinal direction reverse from said first direction; and
(e) releasable securing means for securing the other end of the blade to the other end of the superstructure whereby to prevent movement of the blade out of the groove and in said reverse longitudinal direction;
(f) said superstructure including toe and heel support posts extending upwardly from the blade for securing to a boot, one of said posts having a wall that forms an end wall of the superstructure, and
(g) said releasable securing means including a fixing portion recessed in a cavity in said end wall whereby said fixing portion is accessible from the exterior of the superstructure without occlusion by a boot mounted on the superstructure for securing and releasing the blade, said end wall extending upwardly from the blade to the boot securing means to form a smooth end of the skate.

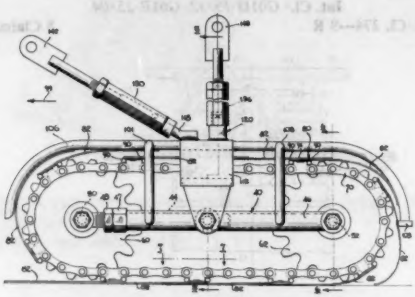
4,218,070

UNPOWERED SUPPORT VEHICLE

Gilbert L. Koepplin, 25173 N. Hwy. 99, Acampo, Calif. 95220

Continuation of Ser. No. 590,140, Jun. 25, 1975, Pat. No. 4,122,901. This application May 24, 1978, Ser. No. 909,027
The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.
Int. Cl.[3] B62D 55/26
U.S. Cl. 280—28.5 **4 Claims**

1. A vehicle comprising:
first and second spaced apart, substantially identical and substantially parallel frame bars which are telescopic and have screw adjustments for varying their lengths;
first and second sprockets connected for rotation substantially at the front and trailing ends of said first frame bar;
third and fourth sprockets connected for rotation substantially at the front and trailing ends of said second frame bar;
a first sprocket chain mounted upon said first and second sprockets;
a second sprocket chain mounted upon said third and fourth sprockets;
a plurality of cross-bars distributed along and connecting said chains;
a plurality of belt segments, sized to fit over said sprocket chains, attached by their leading edge to said cross-bars,



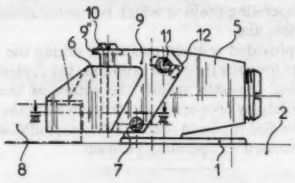
the trailing edge of each said belt segment being unattached and overlying the leading edge of the next following said segment;
first and second angle irons attached, respectively, substantially to the center of said frame bars and extending upwards therefrom; and
a pair of length-adjustable linkages attached to said angle irons to position said vehicle up and down and back and forth relative to the apparatus it supports.

4,218,071

SKI SAFETY BINDING WITH AUTOMATIC COMPENSATING MECHANISM

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Mar. 22, 1978, Ser. No. 889,084
Claims priority, application France, Mar. 29, 1977, 77 09363
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—630 **14 Claims**



1. Ski safety binding releasable at least laterally, comprising
(a) a vertical pivot integral with a base attached to a ski;
(b) a binding member swingably mounted on said pivot and comprising means for retaining a boot;
(c) a locking arrangement comprising holding means mounted in said binding member and assuring the retention of said boot in a predetermined position on said ski, the arrangement comprising at least one resilient element and opposing a vertical retention force and a lateral retention force, respectively, to vertical elevation and to lateral displacement of said boot, said resilient element being preset to permit release of said boot when it is placed under a predetermined constraint in the plane of said ski;
(d) a compensating mechanism acting upon said locking arrangement to produce variations in the lateral retention stress on said boot inverse to the variation in the vertical

retention stress, said compensating mechanism comprising two members movable relative to another and located between the kinematic chain consisting of said resilient element and a reaction member fixed with respect to the ski and located adjacent said vertical pivot;

(e) the first one of said movable members being slidably mounted for translating movement in said binding member; and

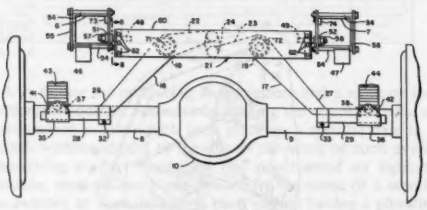
(f) the second one of said members being movably mounted on said first member, in a manner allowing it to rock about an axis extending transversely to the direction of sliding movement of said first member, and cooperating through a system of ramps with said reaction member opposing vertical elevation of said boot.

4,218,072

VEHICLE STABILIZER

Alfred R. Wallis, P.O. Box 957, Minden, Nev. 89423

Filed Aug. 15, 1978, Ser. No. 933,864
Int. Cl.² B60G *11/00*
U.S. Cl. 280—689 **12 Claims**



1. A stabilizer for a vehicle having a chassis and tranversely-positioned wheel supports mounted for vertical movement relative to said chassis comprising:

a pair of levers;

means for pivoting said levers intermediate their ends to said chassis about horizontally spaced longitudinal extending axes;

said levers being formed to dispose normally lower ends adjacent said wheel supports;

means slidably connecting said lever ends to said wheel supports causing conjoint vertical displacement of said lever ends and said wheel supports and including first guide members and pivotal means for mounting said first guide members one to each of said wheel supports for rotation about a longitudinal axis, and second guide members mounted one on each lever end and mounted in slidable embrace with said first guide members;

said levers being formed to provide juxtaposed normally upper ends; and

means formed for pivotal connection of said upper ends to provide conjoint vertical displacement thereof.

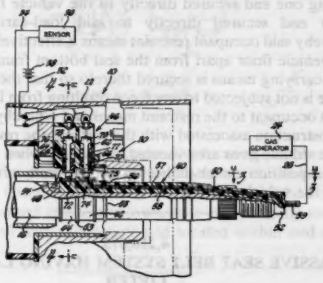
4,218,073

ELECTRICAL CONNECTOR ARRANGEMENT FOR MOTOR VEHICLE STEERING ASSEMBLY

William D. Cymbal, Freeland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 28, 1978, Ser. No. 947,169
Int. Cl.² B60R *21/00*
U.S. Cl. 280—731 **3 Claims**

1. In combination with a motor vehicle steering assembly including a steering column member rotatably supporting a steering shaft fixed with a steering wheel having an occupant restraint cushion, said vehicle having a sensor for actuating said occupant restraint cushion, an electrical connector arrangement interposed between said steering column member and said steering shaft for allowing relative movement therebetween while continuously providing electrical continuity between said sensor and said occupant restraint cushion, said electrical connector arrangement comprising an insulator member including a sleeve portion integrally connected to an elongated tail section, said insulator member carried by said steering shaft in fixed relationship thereto, a pair of conductor rings mounted on said sleeve portion, a terminal section formed at one end of the tail section and including a pair of members movable relative to each other between open and closed positions, said tail section and said sleeve portion being formed so as to removably house a pair of conductors which electrically connect the conductor rings with the occupant restraint cushion, said conductor rings adapted to maintain one end of said pair of conductors in said sleeve portion and said



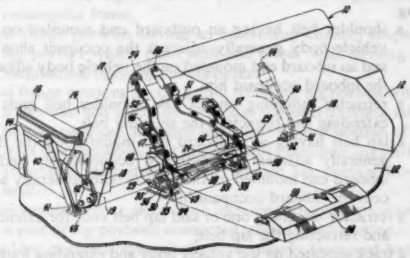
pair of members adapted to maintain the other end of said pair of conductors in said terminal section when in said closed position, said conductor rings being axially spaced along said steering shaft and each conductor ring being located in a plane that is substantially perpendicular to the longitudinal center axis of the steering shaft, a pair of contact button members supported in a housing fixed with said steering column member for continuously maintaining engagement with each of the conductor rings and adapted to provide current to said conductor rings upon operation of said sensor, and spring means mounted in said housing and connected to said contact button members for urging the latter into engagement with said conductor rings.

4,218,074

MOTOR VEHICLE FOLDING SEAT AND SEAT OCCUPANT RESTRAINT ARRANGEMENT

Ray V. Crawford, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1978, Ser. No. 950,732
Int. Cl.² B60R *21/10*
U.S. Cl. 280—801 **3 Claims**



1. In combination with a vehicle body having a floor, a vehicle seat including a seat bottom having a frame with a front rail and a rear rail extending transversely of the vehicle, a seat back, hinge means pivotally connecting the seat back to

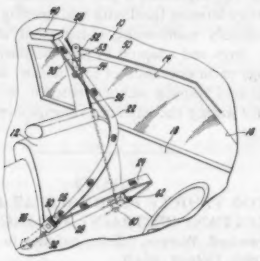
the seat bottom frame for movement between a normal seating arrangement and a folded arrangement permitting seat storage, hinge means pivotally connecting said vehicle floor and said front rail to mount the seat on the vehicle for movement between a normal seating position and a generally upright stored position with the seat back folded upon the seat bottom, rigid seat and occupant restraint load-carrying means substantially shorter in length than said rear rail, said load-carrying means centrally arranged and fixed along its length to said rear rail, anchor means recessed in said vehicle floor, latch means on said load-carrying means for releasably securing said load-carrying means to said anchor means to maintain the seat in its normal seating position and releasably permitting movement to the upright storage position, and occupant restraint means having one end secured directly to the vehicle floor and another end secured directly to said load-carrying means whereby said occupant restraint means is effectively secured to the vehicle floor apart from the seat bottom frame when said load-carrying means is secured thereto so that the seat bottom frame is not subjected to any force resulting from loads applied by an occupant to the restraint means and whereby there is left no obstruction associated with the seat and the restraint means in the vehicle floor area vacated by the seat when moved to its stored position on unanchoring of the load-carrying means from the vehicle floor.

4,218,075

PASSIVE SEAT BELT SYSTEM HAVING LAP BELT LIFTER

Lloyd W. Rogers, Jr., Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1978, Ser. No. 965,310
Int. Cl.[3] B60R *21/10*
U.S. Cl. 280—804 **3 Claims**



1. In combination with a vehicle body having an occupant compartment in which an occupant seat is accessible through a door opening selectively opened and closed by a movable door, a passive occupant restraining belt arrangement comprising:

a shoulder belt having an outboard end mounted on the vehicle body generally adjacent the occupant shoulder and an inboard end mounted on the vehicle body adjacent the inboard occupant hip;

a retractor mounting one of said shoulder belt ends for extending and retracting the shoulder belt;

a lap belt having an outboard end mounted on the door generally adjacent the outboard occupant hip and an inboard end mounted on the vehicle body generally adjacent the inboard occupant hip;

a retractor mounting one of said lap belt ends for extending and retracting the lap belt;

a track mounted on the vehicle body and extending longitudinally forward from the outboard shoulder belt end mounted on the vehicle body;

a carriage slidably receiving the shoulder belt intermediate the inboard and outboard ends thereof and being movable along the track between a rearward position disposing the shoulder belt in a diagonal restraining position adjacent the occupant and a forward position disposing the shoulder belt generally forwardly of the occupant to facilitate occupant ingress and egress;

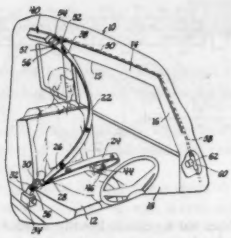
and a flexible lift element of fixed length having an upper end mounted on the vehicle body generally adjacent the rearward position of the carriage and having a lower end connected to the lap belt, said lifter element extending slidably through the carriage whereby the lift element lifts the lap belt upwardly and forwardly of the occupant when the carriage is in the forward position and disposes the lap belt in a restraining position adjacent the occupant when the carriage is in the rearward position.

4,218,076

PASSIVE SEAT BELT SYSTEM

Edward E. Compeau, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1979, Ser. No. 24,107
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—804 **3 Claims**



1. In combination with a vehicle body having an occupant compartment in which an occupant seat is accessible through a door opening selectively opened and closed by a movable door, a passive occupant restraint belt arrangement comprising:

a lap belt having an outboard end mounted on the lower rear portion of the door and an inboard end;

a shoulder belt having an outboard end and an inboard end;

a shoulder belt retractor mounting the outboard shoulder belt end on the vehicle body generally adjacent the upper rear portion of the door for extending and retracting movement;

a control belt attached to the inboard ends of the lap belt and shoulder belt and having an inboard end;

a control belt retractor mounting the inboard control belt end inboard the occupant seat and having a retracting effort relatively greater than the retracting effort of the shoulder belt retractor so that the shoulder belt is extended from the retractor and the lap and shoulder belts are established in restraining positions closely adjacent the occupant;

a carriage slidably engaging the shoulder belt and movable along the body above the door opening between a rearward position adjacent the shoulder belt retractor to dispose the shoulder belt in restraining position across the occupant and a forward position;

means for selectively moving the carriage forwardly along the track to the forward position;

and means for locking the shoulder belt retractor to prevent shoulder belt extension and fix the shoulder belt length when the carriage is moved forward of the shoulder belt retractor whereby forward carriage movement stows shoulder belt above the door opening and extends the control belt from the inboard retractor to lift the inboard lap and shoulder belt ends upwardly and forwardly to facilitate occupant ingress and egress and rearward carriage movement allows retraction of control belt by the

control belt retractor to lower the lap and shoulder belts to the restraining positions.

4,218,077

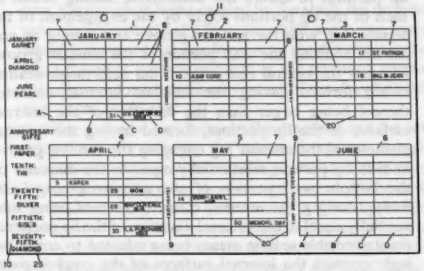
CONSTANT REMINDER MEMORANDUM DEVICE

Jean B. Ember, 426 Girard St., #101, Gaithersburg, Md. 20760

Filed Mar. 5, 1979, Ser. No. 17,337

Int. Cl.³ G09D *3/00*

U.S. Cl. 283—2 **8 Claims**



4. A device for producing an immediate and a more or less permanent constant reminder facilitating the visual retrieval of documented events which took place on a specific date in a month without regard to the day of the week of such event, comprising a chart having on one side thereof six separate sections, each section being headed by the name of a month, i.e. January to June, inclusive, each section having a plurality of spaced horizontal demarcation lines beneath said month heading the spaces between said horizontal line forming rows adapted for entry of the desired events and their associated dates, the number of said horizontal lines and hence the number of rows being considerably less than the number of days in any month, a plurality of vertical demarcation lines forming no more than four columns intersecting said horizontal lines, the extreme left hand column being designed for the entry of dates of the month at which the event occurred and the adjacent column for the entry of the name of the event, the reverse side of the chart having the same number of sections and the same line and space arrangement but the sections being headed by the names of the remaining months, July to December inclusive, thereby providing a six month visual display of events at a glance on one side of the chart, whereby since the date of the event is independent of the particular day of the week, thus rendering the device a perpetual record usable year after year.

4,218,078

PIPE CONNECTIONS

Alan S. Lee, Leicester, England, assignor to The English Electric Company Limited, London, England

Filed Jul. 10, 1978, Ser. No. 923,387

Claims priority, application United Kingdom, Jul. 11, 1977, 29008/77

Int. Cl.² F16L *5/00, 9/10*

U.S. Cl. 285—115 **7 Claims**

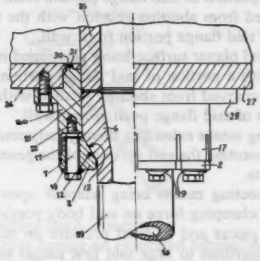
1. The connection of an end-section of a pipe of brittle material to a further article, wherein said end-section of the pipe is formed with an external diameter larger than the adjoining part of the pipe, and has a conical back surface, said connection including

(A) a locating member having a cylindrical aperture within which said end-section of the pipe is a sliding fit, and which serves to locate the end-section against transverse movement,

(B) fastening means for fastening said locating member to said further article,

(C) a plurality of gripping members each having an inclined abutment surface,

(D) means for securing the gripping members around the locating member to cause the abutment surfaces to engage co-operating circumferentially spaced regions of said back-surface and urge the end-section of the pipe into the aperture of the locating member, and



(E) spring means action between the locating member and each of the gripping members such that, with the locating member fastened to said further article, the end face of the pipe is urged resiliently towards a co-operating surface associated with said article and located within said aperture.

4,218,079

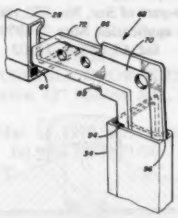
FLANGE TYPE DUCT JOINT ASSEMBLY

Peter J. Arnoldt, Puce, Canada, assignor to Ductmate Industries, Inc., Pittsburgh, Pa.

Filed Jan. 26, 1978, Ser. No. 872,644

Int. Cl.² F16L *23/00*

U.S. Cl. 285—331 **9 Claims**



1. A flange type duct joint assembly to connect the end portions of generally rectangular ducts comprising,

a plurality of flange portions connected to adjacent flange portions by angular corner pieces to form a generally rectangular frame,

said flange portions having an upstanding channel shaped leg portion with a front wall and a rear wall forming a longitudinal opening therebetween,

said flange portions having a duct receiving leg portion with a top wall and a bottom wall, said top wall abutting said bottom wall and arranged to receive an end portion of a duct therebetween, said bottom wall extending angularly from said upstanding channel shaped leg portion front wall,

said angular corner pieces each including a body portion and a pair of leg portions connected to said body portion,

said leg portions being displaced angularly from said body portion and positioned in parallel relation to said body portion so that said body portions of adjacent corner pieces of the assembly are in abutting relation while said adjacent pairs of leg portions are spaced from each other a distance substantially equal to the thickness of said flange portions front wall,

said angular corner pieces each having a concave recessed portion extending longitudinally in said leg portions to thereby form a first planar surface displaced in parallel relation to a second planar surface,

said first planar surface being positioned in abutting relation with a portion of said flange portion front wall and being removed from abutting relation with the remaining portion of said flange portion front wall,

said second planar surface being positioned in abutting relation with a portion of said flange portion rear wall and being removed from abutting relation with the remaining portion of said flange portion rear wall,

connecting means extending through adjacent corner pieces for connecting the end portions of the generally rectangular ducts,

said connecting means being adapted upon tightening to exert a clamping force on said body portions of adjacent corner pieces and to exert pressure on said concave recessed portions to urge said first planar surfaces toward each other and thereby concentrate the application of sealing forces upon said portion of said flange portion front wall to increase the sealing forces applied to said flange portions at said corner pieces, and

paste like gasket material positioned in said upstanding channel shaped leg portion longitudinal opening in abutting relation with said duct receiving leg bottom wall and with the inner surface of said channel shaped leg portion, said paste like gasket material adapted to be positioned between said duct end portion and the upper surface of said duct receiving leg bottom wall to sealingly connect said duct end portion to said frame flange portion.

4,218,080

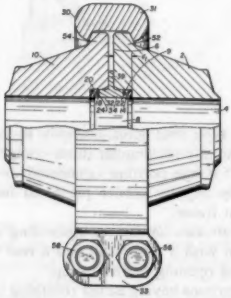
REPAIRABLE COMPOSITE SEAL RING

William D. Kendrick, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 873,180, Jan. 30, 1978, abandoned. This application May 7, 1979, Ser. No. 36,634

Int. Cl.³ F16L *19/02*

U.S. Cl. 285—347 **4 Claims**



1. A composite annular seal adapted to be interposed between two opposed conduit parts and to mate with the internal surfaces of the conduit parts when the conduit parts are in an assembled relationship, the composite annular seal comprising:

an annular member of relatively hard material including

a central rim portion having two generally axially disposed annular lip portions extending longitudinally oppositely outwardly from said central rim portion, each of said lip portions having one end connected to the central rim and having an annular groove therein adjacent the other end of the annular lip portion formed having a reduced diameter outer wall portion which is of a diameter less than the external diameter of said lip portions, having a bottom wall portion and having a wall portion adjacent the central rim,

whereby the internal surfaces of the central rim portion and the lip portions define a continuous cylindrical surface having a substantially constant diameter while the external diameters of the lip portions are substantially equal, and

deformable sealing means extending continuously peripherally about each of said lip portions and having an annular lug removably engaging the annular groove in each of the lip portions to secure the deformable sealing means to each of the lip portions solely by the engagement of the annular lug with the annular groove and having an end surface abutting the wall portion of the annular groove adjacent the central rim portion, the deformable sealing means formed having the smallest internal diameter thereof being larger than the diameter of the internal surfaces of the lip portions, formed having the internal diameter of the annular lug engaging the annular groove in each lip portion substantially equal to the diameter of the bottom wall portion of the annular groove, and formed having the external diameter thereof being substantially equal to the external diameter of the lip portions, the deformable sealing means being adapted to conformingly contact the internal surfaces of the conduit parts when the conduit parts are in an assembled relationship with said composite annular seal interposed therebetween by the end surfaces of the deformable sealing means contacting portions of the conduits thereby compressing the deformable seal means between the portion of the conduit and the wall portion of the annular groove in the lip portion adjacent the central rim portion until the deformable portion flows to sealingly engage said conduit parts and said composite annular seal whereby a seal is formed solely by the deformable sealing means engaging portions of said conduit parts.

4,218,081

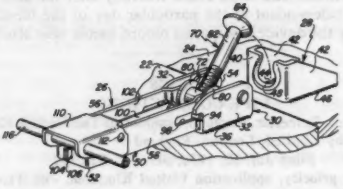
LATCH WITH MULTIPLE FUNCTION PREVAILING-TORQUE MECHANISM

Norman S. Johnson, New Milford, N.J., assignor to United Products Inc., South Hackensack, N.J.

Filed Nov. 20, 1978, Ser. No. 962,330

Int. Cl.² E05C *5/02*

U.S. Cl. 292—66 **19 Claims**



1. A latch of the type having a latch member to be carried by a first part and a strike to be carried by a second part for latching engagement with the latch member to secure together the first and second parts, said latch comprising:

a latch base;

means for affixing the latch base to the first part:

an actuating lever including a pair of lever arms extending longitudinally generally parallel to one another and spaced apart laterally;

means for mounting the actuating lever on the latch base for pivotal movement between first and second locations relative to the latch base;

a drawbolt;

means for mounting the drawbolt on the actuating lever for swinging movement relative to the actuating lever be-

tween a first position, wherein the drawbolt is positioned relative to the actuating lever for latching engagement with the strike when the actuating lever is in the first location, and a second position, wherein the drawbolt is positioned relative to the actuating lever for disengagement from the strike when the actuating lever is in the second location and away from the strike when the actuating lever is in the first location, the means for mounting the drawbolt on the actuating lever including a shaft extending laterally between the lever arms and journalled for rotation therein, the shaft including a threaded aperture, the drawbolt being carried by the shaft, the drawbolt extending longitudinally from the shaft and being spaced laterally from at least one lever arm, the drawbolt including a threaded portion engaged in the threaded aperture for selective longitudinal movement of the drawbolt relative to the shaft; and

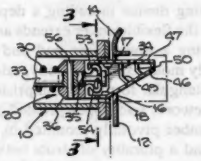
prevailing-torque means between the drawbolt and the actuating lever for holding the drawbolt against swinging movement relative to the actuating lever such that swinging movement between the first and second positions will be enabled only upon overcoming a given prevailing torque, the prevailing-torque means including at least one friction element located on the shaft between the drawbolt and the one lever arm for exerting a frictional force to establish the given prevailing torque, whereby pivotal movement of the actuating lever from the first location to the second location when the drawbolt is engaged with the strike will enable movement of the drawbolt relative to the actuating lever from the first position to the second position, against the given prevailing torque, and pivotal movement of the actuating lever from the second location toward the first location, with the drawbolt held in the second position by the prevailing-torque means, will withdraw the drawbolt from the strike, the friction element engaging the drawbolt to establish a further prevailing torque tending to retain the drawbolt in a selected longitudinal position relative to the shaft.

4,218,082

ANTI-FRICTION LATCH INSERT AND FASTENING MEANS

James G. Allemann, Santa Ana, Calif., assignor to Norris Industries, Inc., Long Beach, Calif.

Filed Jan. 26, 1979, Ser. No. 6,736
Int. Cl.² E05C *1/16*
U.S. Cl. 292—173 **11 Claims**



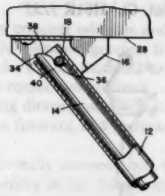
1. An anti-friction latch bolt member comprising a latch bolt head with a rod extending therefrom for mounting and actuating said member, an anti-friction insert on the latch bolt head and an attachment between the insert and the latch bolt head, said attachment comprising spring means forming part of the insert having a slot therein and a projection on a portion of the latch bolt member in releasable engagement with the slot.

4,218,083

DOOR HOLDING LATCH

Arnold H. Dillemuth, 4680 Norma Dr., San Diego, Calif. 92115

Filed Apr. 4, 1979, Ser. No. 26,960
Int. Cl.² E05C *17/30*
U.S. Cl. 292—262 **6 Claims**



1. A door holding latch, comprising:

a telescopic strut having an elongated tubular sleeve with a torsionally resilient cylindrical latch rod axially slidable therein;

opposite ends of said sleeve and latch rod having means for attachment between a door and adjacent supporting structure;

said sleeve having a latch pin extending therethrough;

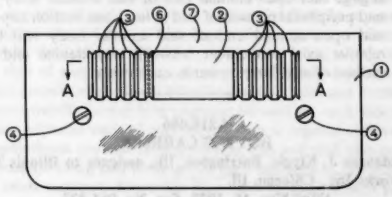
the end of said latch rod enclosed in the sleeve having a tapered head to pass between the latch pin and the wall of the sleeve, with a notch extending across the rod to receive the latch pin, said notch being angularly offset from the axis of the latch pin, whereby the latch rod is torsionally twisted when the notch is engaged with the latch pin.

4,218,084

ADJUSTABLE DOOR STRIKE

Raymond F. Musacchia, 427 Spencer Ave., New Orleans, La. 70124

Filed Mar. 23, 1979, Ser. No. 23,465
Int. Cl.² E05C *13/00*
U.S. Cl. 292—341.19 **2 Claims**



1. An adjustable door strike to correct for misalignment between doors and door frames, comprising:

(a) a vertical base plate;

(b) a hole located along one edge of said base plate, said hole for receiving a door lock bolt;

(c) a plurality of pop-off/break-away tabs juxtaposed to said hole, said tabs designed to break-away/pop-off to expand said hole or opening in said base plate, said tabs fitted with grooves along a horizontal edge in the spot desired for breaking-away/popping-off and each said groove successively grooved slightly deeper than each succeeding groove, the deepest groove being nearest the hole.

4,218,085
DEVICE FOR SCREWING IN AND OUT ELECTRICAL LAMPS

Henry M. Unger, No. 24, Sunset Dr., Weston, Conn. 06880

Filed Jan. 31, 1979, Ser. No. 8,020

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804764

Int. Cl.³ H01K 3/32

U.S. Cl. 294—20 11 Claims

4. A device for screwing in and out electrical lamps located at an elevated position from a floor, comprising

(a) an elongated member;

(b) a rigid head having one side thereof connected to one end of said elongated member;

(c) at least one resilient annular suction cup mounted on the side of said head opposite said elongated member for engaging the surface of a lamp, the peripheral portion of said at least one suction cup being flexible and unsupported;

(d) a rigid annular body encompassing said head and said at least one suction cup and having an open annular end in a plane spaced from said opposite side of said body; and

(e) means for axially adjusting and securing said annular body on said head such that said plane defined by said open annular end of said annular body may be adjusted axially relative to the plane defined by said at least one suction cup;

(f) whereby said annular body may be adjusted and secured such that the surface of said lamp will simultaneously engage said open annular end of said annular body and said peripheral portion of said at least one suction cup and said open annular end of said annular body will limit relative axial movement between said device and the surface of said lamp towards each other.

4,218,086
BOTTLE CARRIER

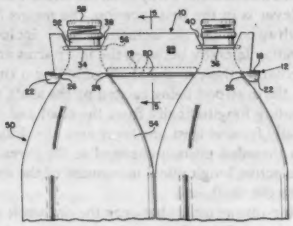
Mindaugas J. Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 16, 1978, Ser. No. 961,323

Int. Cl.³ B65D 71/00

U.S. Cl. 294—87.2 8 Claims

1. A carrier for a linear array of bottles having a reduced neck portion and a shoulder means adjacent the upper extremity of the neck portion, the carrier being formed from a sheet of plastic material, the carrier being generally tubular defining an upper region and bottom wall region with side walls extending downwardly and outwardly from the upper region joining the bottom wall region, the upper region and upper marginal surfaces of opposing side walls including a plurality of longitudinally spaced upper apertures centered about a longitudinal axis of the carrier, each aperture providing a pair of opposed side edges in each side wall, the bottom wall including a plurality of longitudinally spaced lower apertures below the upper apertures and in registry therewith, a central portion of the bottom wall intermediate a pair of lower apertures being V-shaped in cross-sectional configuration with the apex of said bottom wall portion directed upwardly so that lateral compressive forces on said side walls readily decrease the transverse dimension between the pair of opposed side edges in the side walls wherein the bottom wall includes end wall portions longitudinally outwardly of the lower apertures and the central wall portion, said end portions of the bottom wall being generally straight and perpendicularly disposed relative to a vertical plane extending longitudinally including the central longitudinal axis of the carrier.



4,218,087
COVERED VEHICLE CONTAINER BODIES

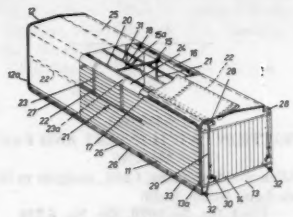
George E. Neville, Mansfield, England, assignor to George Neville Truck Equipment Limited, Nottinghamshire, England

Filed May 9, 1978, Ser. No. 904,213

Claims priority, application United Kingdom, May 11, 1977, 19682/77

Int. Cl.³ B60P 7/04

U.S. Cl. 296—100 10 Claims



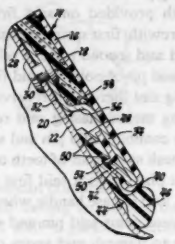
1. A covered vehicle container body having end walls and having at least one side of the body covered by a flexible cover, and an uncovering device including a dependent framework and over which the flexible cover extends and is supported, the framework having a lower, free end and an upper pivoted portion, pivotally mounted on the body, said framework being generally of rectangular form and comprising a bar at the free end of the framework, said upper pivoted portion comprising an elongate member pivotally mounted in stationary manner on said body, and a plurality of struts between said elongate member and the bar and interconnecting said elongate member and bar, wherein said body has a longitudinal roof beam positioned on the longitudinal median plane of said container body, said flexible cover being secured to the beam, and a further of said framework and a further of said covers are provided at the opposite side of said body; and operating means for upwardly pivotally moving the framework about the pivot axis of said pivoted portion, so that the free end effects folding of the flexible container and uncovering said one side of the body.

4,218,088

VEHICLE VINYL TOP AND TOP RETAINER MEANS

Carl P. Swindlehurst, Sterling Heights, and Sam J. Navarro, Dryden, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1978, Ser. No. 927,506
Int. Cl.[2] B62D *25/06*
U.S. Cl. 296—210 **4 Claims**



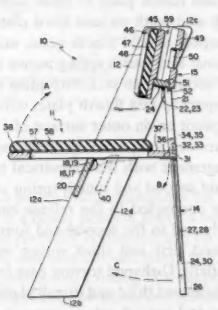
1. In combination a panel forming a portion of a vehicle body, a sheet of flexible material providing a cover for said panel, a retainer strip comprising a base portion attached to said panel, a cover attachment portion offset from said base portion and spaced outwardly from said panel, an intermediate connector portion extending between and connecting said base portion and said cover attachment portion, said cover attachment portion having a resilient lip portion reversely curved inwardly from an outer peripheral limit thereof and terminating in an edge disposed closely adjacent to said body panel; said cover having edge portions disposed over said cover attachment portion and around the peripheral limit thereof and tucked into the space between said lip portion and the outer surface of said body panel, a finishing and attaching lace having an enlarged bead portion and finger means extending inwardly therefrom, teeth means on said finger means extending upwardly therefrom to deflect said lip portion and to entrap said free edge of said cover between said teeth means and said lip portion on insertion of said finger means between said panel and said lip portion to thereby secure said cover to said panel and to provide a finished appearance.

4,218,089

FOLDING CHAIR

Pier-Angelo Beltrami, and Franz Halmdienst, both of 481 8th Ave., New York, N.Y. 10001

Filed Jun. 5, 1978, Ser. No. 912,473
Int. Cl.[2] A47C *4/04*
U.S. Cl. 297—58 **13 Claims**



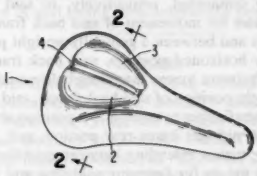
1. A folding chair comprising:
a seat;
two side legs being disposed on opposite sides of said seat, and means to pivot said seat to said side legs;
a back, said back being connected to said side legs and being formed with a rearward extension;
one rear leg; said rear leg being centrally disposed to said seat and back and being spacedly disposed from said side legs;
means to slidably connect said seat and rear leg comprising a pair of parallel disposed grooves formed in said rear leg and a pair of pins fixedly mounted to said seat and slidably moving in the respective grooves;
said side legs being dimensioned so that said seat and rear leg fold within the forward and rearward extent of said side legs;
and means to pivotally connect said rear leg to said back extension, whereby in the folded open position said rear leg extends downwardly from said extension and outwardly from said side legs, and in the folded closed position said seat pivots with respect to said side legs and slides within said rear leg, and said rear leg pivots on said back extension to fold inwardly so that said seat and rear leg oppositely pivot and infold to reside within said forward and rearward extent of said side legs.

4,218,090

BICYCLE SEAT

Neal D. Hoffacker, 920 Hamilton Ave., Palo Alto, Calif. 94301, and Bernhard J. Hoffacker, 104 Alta Mesa, Woodside, Calif. 94062

Filed Feb. 16, 1978, Ser. No. 878,531
Int. Cl.[2] B62J *1/18*
U.S. Cl. 297—214 **2 Claims**



1. A bicycle seat of the type having a flexible shell portion including a narrow leading edge portion with a downwardly turned tip, a wider trailing end portion with a centermost portion, a first relatively thinned and flexible pelvic zone lying along one side of said centermost portion for flexibly supporting one portion of the pelvic region of a cyclist, a second relatively thinned and flexible pelvic zone lying along the other side of said centermost portion for flexibly supporting another portion of the cyclist's pelvic region, said seat further has downwardly turned side portions located on each side of said seat adjacent each of said thinned pelvic regions and with said centermost portion of said trailing end and said side portions located along said trailing end each having a larger transverse cross-sectional dimension than each of said thinned pelvic zones, the improvement wherein an amount of padding material is distributed over said flexible shell including each of said thinned pelvic zones, said centermost portion and said downwardly turned side portions, with a larger amount of said padding being distributed over said thinned pelvic zones than is distributed over the remaining portions of said shell to form bumps of padding over each of said thinned pelvic zones such that when a cyclist's pelvic region contacts said bumps over said thinned zones, said padding bumps are depressed as the padding under said bumps is distributed over said thinned zones in a downwardly direction, said padding under said bumps over said thinned zones being further distributed over said centermost and said side portions of said seat to provide for cyclist comfort.

4,218,091

RECLINABLE VEHICLE CHAIR AND CONVERSION METHOD

David L. Webster, Orange, Calif., assignor to Kustom Fit Manufacturing Company, South Gate, Calif.

Filed Jun. 27, 1978, Ser. No. 919,497
Int. Cl.³ A47C 1/024
U.S. Cl. 297—354 **3 Claims**

1. A reclinable vehicle chair comprising:

(a) a generally rectangularly contoured seat frame adapted for mounting to a floor and including a front portion, a discontinuous rear portion having a first and second section rigidly coupled each to the other, said first section being displaced a greater distance from said front portion than said second section, and a pair of side portions having, respectively, a first pair of upwardly projecting hinge plates fixedly secured to said side portions of said seat frame and positionally located adjacent said seat frame rear portion, said first pair of hinge plates defining a horizontal pivot axis, said seat frame including first abutment means positioned adjacent said seat frame front portion;

(b) a back frame including a second pair of hinge plates pivotally connected, respectively, to said first pair of hinge plates for movement of said back frame about said pivot axis and between a generally upright position and a generally horizontal position, said back frame including second abutment means extending below said pivot axis in said upright position of said back frame, said second abutment means further extending to a position above said first section of said seat frame rear portion; and,

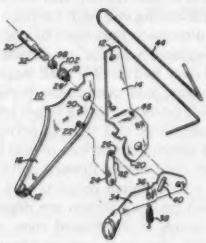
(c) coupling means extending between said first and second abutment means for fastening said first and second abutment means each to the other, said coupling means extending substantially internally of said seat frame rectangular contour.

4,218,092

SEAT RECLINER MECHANISM

Robert E. Schach, Rochester, and Richard L. Van Eerden, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 23, 1978, Ser. No. 889,275
Int. Cl.² A47C 1/025
U.S. Cl. 297—367 **3 Claims**



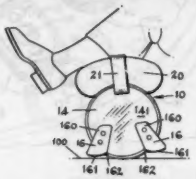
1. A seat recliner mechanism comprising a first plate for attaching to one side of the back of said seat; a second plate pivotally connected to said first plate; said first plate being provided with a series of teeth formed in an arc whose radius is coincident with the pivot point of said first and second plates; said second plate to be attached to one side of the cushion of said seat; said second plate pivotally carrying a locking pawl having a pin attached thereto whose longitudinal axis is parallel to the longitudinal axis through said pivot point, said locking pawl being provided with a series of teeth complementary to said teeth provided on said first plate for selective intermeshing therewith; first spring means to pivotally bias said first plate toward said second plate; a release handle pivotally connected at at said pivot point to said first and second plates having a camming slot therein for receiving and camming said pin; second spring means biasing said release handle toward said second plate camming said pin and said pawl toward said second plate to mesh said series of teeth on said pawl with said teeth on said first plate to lock said first plate with respect to said second plate, said release handle when pivoted against said second spring means cams said pin and said pawl away from said second plate to unmesh said series of teeth on said pawl with said teeth on said first plate to unlock said first plate with respect to said second plate, said first and second plates pivot on an outer surface of a bushing, said release handle connected to a first rotary connecting shaft received within said bushing and in bearing engagement with the cylindrical inner surface thereof, said first rotary connecting shaft is coupled to a second rotary connecting shaft, the length of said first and second rotary connecting shafts generally spanning the width of said seat back and said seat cushion, the outboard end of said second rotary connecting shaft being drivingly connected to a release lever, wherein a third plate is attached to said back of said seat at the side opposite said first plate; a fourth plate pivotally connected to said third plate, said third plate being provided with a series of teeth formed in an arc whose radius is coincident with the pivot point of said third and fourth plates, said fourth plate to be attached to the cushion of said seat at the side opposite said second plate, said fourth plate pivotally carrying a locking pawl having a pin attached thereto whose longitudinal axis is parallel to the longitudinal axis through said pivot point, said locking pawl being provided with a series of teeth complementary to said teeth provided on said third plate for selective intermeshing therewith; third spring means to pivotally bias said third plate toward said fourth plate, said release lever acting in concert with said release handle through said first and second rotary connecting shafts, said release lever having a camming slot therein for receiving and camming said pin; fourth spring means biasing said release lever toward said fourth plate camming said pin and said pawl toward said fourth plate to mesh said series of teeth on said pawl with said teeth on said third plate to lock said third plate with respect to said fourth plate, said release lever when pivoted against said fourth spring means cams said pin and said pawl with said teeth on said third plate to unlock said third plate with respect to said fourth plate, wherein said third and fourth plates pivot on an outer surface of a bushing, said second rotary connecting shaft received within said bushing and in bearing engagement with the cylindrical inner surface thereof, wherein said second and fourth spring means are helically wound springs connected to the release handle and release lever respectively and to the second and fourth plates respectively, wherein said first and third spring means are inwardly facing substantially U-shaped torsion bars connected to the first and second plates and third and fourth plates respectively, wherein said first and second rotary connecting shafts are mechanically coupled to each other in a non-interference fit at substantially the mid point of said cushion and back of said seat.

4,218,093

MASSAGE OTTOMAN

Herman F. Gertz, 1016 N. Monroe St., Monroe, Mich. 48161

Filed Mar. 28, 1979, Ser. No. 24,610
Int. Cl.[2] A47C 9/00
U.S. Cl. 297—439 3 Claims



1. A massage ottoman comprising

a cylindrical shell having an uninterrupted curvilinear extending lateral wall in parallel relation to a horizontally extending major longitudinal axis and adapted to be floor engaging and supported for rolling contact therewith;

a pair of feet;

each foot of the pair of feet being in engagement with and extending substantially radially of the mentioned curvilinearly extending wall, in a circumferentially spaced angular relation less than a normal angle to the other foot of the mentioned pair of feet;

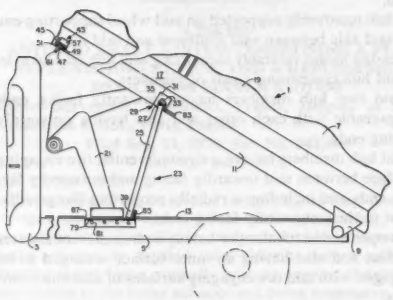
each foot having a surface arcuately extending outwardly from the lateral shell wall from a point at one of opposite ends of a line extending in chordal relation to the discular wall part and adapted, when the cylindrical shell rolls in a direction toward that in which the stay end component extends, to engage the floor and limit the further rolling movement of the shell.

4,218,094

SAFETY BRACE

John Y. Leaver, Quincy, Ill., assignor to The Knapheide Mfg. Co., Quincy, Ill.

Filed Feb. 6, 1978, Ser. No. 875,470
Int. Cl.[2] B60P 1/04
U.S. Cl. 298—17 B 13 Claims



10. A safety brace mechanism for supporting a vehicle body when in a raised position above a vehicle chassis to which said body is pivotally connected and on which said body normally resides, and wherein said safety brace mechanism is capable of being retained in a riding, non-supporting position and a raised body supporting position, said mechanism being so constructed and arranged as to be capable of being moved from its riding, non-supporting position to its raised body supporting position without an operator being located under the body when the body is in any raised position above the vehicle chassis even if the chassis is tilted at a substantial degree from the horizontal, the mechanism comprising:

an elongated post-like support column having a first and a second end, means pivotally connecting the first end to the vehicle body in such a way that if said support column were free to rotate about said pivot means, said column would assume a vertical posture as governed by gravity, and runway means connected to and extending from said chassis, said runway means having an upstanding projection means located at a point displaced from that of the vertical posture of said column as governed by gravity for engaging and securely retaining the second end against movement when said column is in its raised body supporting position,

an obstruction means connected to said body proximal the first end of the column and located in the path of rotation of the column as governed by gravity capable of preventing said column from reaching a location at or substantially close to its vertical posture when said chassis is horizontal and said body is raised thereabove a sufficient distance such that, without said obstruction, said column would normally assume a vertical posture as governed by gravity, the obstruction forming a point of engagement with said column within the path of rotation of the column as governed by gravity which is in alignment with the upstanding projection means for securely retaining the second end of said column against movement such that at said point of engagement said second end of the column can be automatically brought into securing retention with said upstanding projection means from a position adjacent said upstanding projection means by pivoting said body toward said chassis even if the chassis is tilted at a substantial degree from the horizontal, and

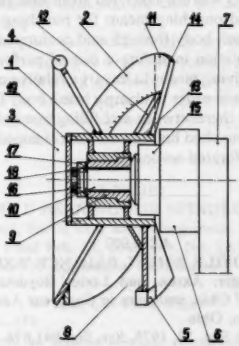
means attached to said body for detachably retaining said column in said riding, non-supporting position.

4,218,095

MINING UNIT OF COAL COMBINES

Zygmunt Jaromin, Katowice; Boleslaw Szymczyk, Rybnik; Andrzej Biazewicz, Tychy, and Klemens Pilarski, Gliwice, all of Poland, assignors to Centrainy Osrodek Projektowo-Konstrukoyjny Maszyn Gorniczych "KOMAG", Gliwice, Poland

Filed Feb. 12, 1979, Ser. No. 11,706
Claims priority, application Poland, Feb. 23, 1978, 204897
Int. Cl.[3] E21C 27/24, 35/20
U.S. Cl. 299—87 6 Claims



1. A mining unit of a coal combine, comprising a cylinder, a cap plate on said cylinder, and helical panels on said cylinder, said cap plate and said helical panels being mounted with their inner diameters on said cylinder, said combine including a body with a protruding portion extending within said cylinder, and a shaft extending from said protruding portion, a hub secured to and mounted inside said cylinder on said shaft, said

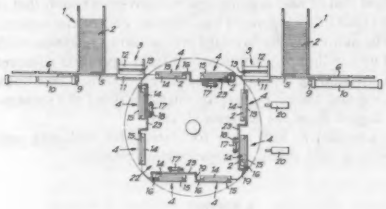
cap plate having a wall of conical form with an apex directed towards the combine, the conical wall of said cap plate being provided with large slots connecting the interior of the cone with a space between the helical panels, said cylinder protruding beyond said hub towards the combine and supporting the helical panels, which protrude above the body of the combine, said panels having triangular surfaces protruding beyond the edge of the cylinder, said triangular surfaces extending above the body of the combine beyond the cylinder, the triangular surfaces having an apex on the surface of the cylinder and a base which lies on the perimeter of the helical panel, and a plate between the helical panel, and the cylinder covering corners formed by the helical panel and the cylinder.

4,218,096

DEVICE FOR HANDLING BRUSH BODIES MADE OF FLEXIBLE MATERIAL

Leonel P. Boucherie, Rumbeke, Belgium, assignor to Firma G. B. Boucherie, naamloze rennootschap, Izegem, Belgium

Filed Dec. 12, 1978, Ser. No. 968,735
Claims priority, application Belgium, Apr. 27, 1978, 56922
Int. Cl.[2] A46D *3/06*
U.S. Cl. 300—3 **8 Claims**



1. A device for handling brush bodies of flexible material, including a supply station, a punching station, a filling station and feeding means for supplying brush bodies one at a time and for feeding each brush body from said supply station successively to said punching station and said filling station, said punching station including a pair of perforated first plates, first driving means to impart a relative movement to said first plates in order to clamp a brush body fed from said supply station therebetween and punching means for punching holes in the thus clamped brush body through said perforated first plates, and said filling station including a pair of perforated second plates, second driving means to impart a relative movement to said second plates in order to clamp a brush body fed from said punching station therebetween and filling means for inserting bristles into the punched holes of the thus clamped brush body through said perforated second plates.

4,218,097

LOW PROFILE WHEEL BALANCE WEIGHT

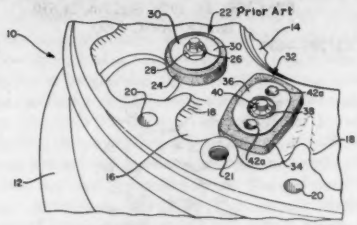
Kenneth J. Olinger, Akron, and Lester Boydelatour, North Canton, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Sep. 13, 1978, Ser. No. 941,874
Int. Cl.[2] B60B *27/00*
U.S. Cl. 301—5 B **11 Claims**

1. A low profile wheel balance weight assembly for connecting to a wheel, comprising:

a weight having first, second, and third holes passing therethrough;

a plate having a well pressed therein, said well being recieved within said first hole and further having a pair of rims depending therefrom, said rims being received by said second and third holes; and



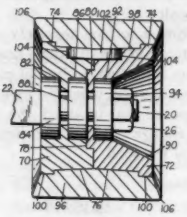
securing means received within said well for securing said weight to the wheel.

4,218,098

SKATE WHEEL ASSEMBLY

Elwin E. Burton, 6530 SE. 89th Ave., Portland, Oreg. 97266

Continuation-in-part of Ser. No. 921,367, Jul. 3, 1978, abandoned. This application Sep. 15, 1978, Ser. No. 942,650
Int. Cl.[2] A63C *17/22*
U.S. Cl. 301—5.7 **3 Claims**



2. A skate wheel assembly comprising

(a) an axle having a free wheel supporting end with a removable nut thereon and an abutment spaced from said free end,

(b) a hub removably supported on said wheel supporting end of said axle between said abutment and said nut,

(c) bearing means rotatably supporting said hub on said axle,

(d) said hub comprising a pair of members,

(e) said two hub members having inwardly facing ends engageable with each other and also having outwardly facing ends,

(f) said hub members having a circumferential tire engaging surface between said inwardly facing and outwardly facing ends and including a radially projecting flange adjacent to their outwardly facing ends,

(g) an open ended tubular tire having a circumferential outer surface and also having an inner surface arranged to be engaged with said tire engaging surfaces of said hub members,

(h) the inner surface of said tire having notches therein receiving said radially projecting flanges,

(i) said tire engaging surfaces and said flanges and notches being symmetrical on the two hub members and tire whereby upon removing the hub and tire from said axle, said tire can be turned end for end,

(j) the ends of said tire being tapered outwardly from said inner surface to said outer surface to form a sharpened edge at said outer surface,

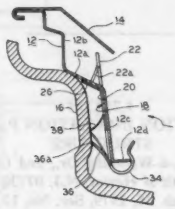
(k) and means on said hub portions and tire preventing relative rotation of said hub portions and tire.

4,218,099

WHEEL COVER HAVING SNAP-ON RETENTION MEANS

Jack A. Bayman, Valdosta, Ga., and Robert G. Green, Monroe, Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 9, 1978, Ser. No. 958,982
Int. Cl.[2] B60B 7/00
U.S. Cl. 301—37 R **10 Claims**



1. A wheel cover for a vehicle wheel having an annular generally radially facing and axially extending wheel flange, said wheel cover comprising, in combination:

a retention ring having a generally axially extending retaining flange with an intermediate stepped portion extending generally radially outwardly;

a plurality of circumferentially spaced retention clips in snap-on engagement with said retention ring, each clip including:

an axially and circumferentially extending base portion engaging the radially outward side of said retaining flange and having at least one tab at the axially outward end of said base which projects through a slot in said stepped portion of said retaining ring and axially outwardly from the radially inward side of said retaining ring;

a reverse-bent portion at the axially inner end of said base portion which encircles the free end of said retention ring;

at least one generally radially outwardly extending retention tooth on said base portion and terminating in biting edge portions for engaging said wheel flange; and,

wherein said clip includes an additional tab at said axially outward end of said base which projects radially and axially outwardly from said base for engaging the axially inward side of said stepped portion.

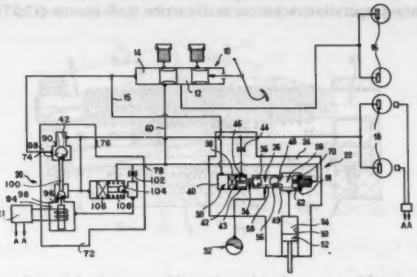
4,218,100

ANTISKID BRAKE SYSTEM COMPRISING A FLUID REPLENISHING DEVICE, AND A REPLENISHING DEVICE FOR SUCH A SYSTEM

Gilbert Kervogoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Sep. 11, 1978, Ser. No. 941,490
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—119 **11 Claims**

1. An antiskid brake system comprising at least one brake actuator associated with a wheel brake of a vehicle, a fluid pressure source controlled by an operator and connected to the brake actuator by antiskid valve forming means, said valve forming means being normally open to connect the said pressure source to the brake actuator and being responsive, during a braking phase, to the detection of a risk of skidding of the wheel so as to interrupt the fluid connection between the pressure source and brake actuator until the end of the braking phase, and so as to permit subsequently during the braking phase a fluid connection between the brake actuator and a low pressure source in response to the detection of any risk of skidding, the antiskid brake system being characterized in that it includes a device for replenishing said actuator which comprises a pressure fluid reserve source and a connection to connect the reserve source to the brake actuator, means for controlling the flow of fluid through the connection, said control means comprising a valve forming element situated in the connection and normally urged on to a seat under the influence of the pressure from the reserve source, operating means responsive to a pressure difference between the pressure



supplied by the pressure source controlled by an operator and the pressure prevailing downstream of the valve forming element, so as to effect opening of this valve when the pressure difference exceeds a predetermined value.

4,218,101

LOW DISTURBANCE TRACK CLEAT AND ICE CALK STRUCTURE FOR FIRM OR ICY SNOW

James A. Thompson, Logan, Utah, assignor to De Lorean Manufacturing Company, Bloomfield Hills, Mich.

Filed Apr. 3, 1978, Ser. No. 892,710
Int. Cl.[2] B62D 55/24, 55/28
U.S. Cl. 305—35 EB **10 Claims**

6. A combination cleat and ice calk for a vehicle crawler track comprising

an elongated plate member formed to provide an elongated generally triangulated oval cross section and having base, leading and trailing portions, a sleeve transversely attached to the leading portion of said member at a position along the length thereof, and

an ice calk retained in said sleeve.

4,218,102

SPINDLE BEARING FOR SPINDLE SHAFT

Fernand Moser, Sur le Cret 83H, Corgemont, Switzerland

Filed Feb. 21, 1979, Ser. No. 13,116
Claims priority, application Switzerland, Feb. 23, 1978, 1990/78
Int. Cl.[3] F16C 19/36
U.S. Cl. 308—174 **9 Claims**

1. Apparatus for spindle bearing, comprising

support means;

carrier shaft means;

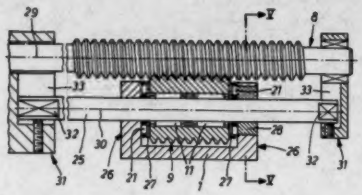
spindel shaft means;

at least a roller means; and

first and second needle bearing means;

wherein said roller means (9) are rotatably supported on said carrier shaft means (12,25), the thread of said spindle shaft

means (8) being in gear with groovings on the circumference of said roller means (9); wherein said roller means are placed paraxially to said spindle shaft means and are supported in a way that the relative position of the axis of said roller means and of the axis of said spindle shaft means is not changed during operation; wherein said carrier shaft means (12;25) is

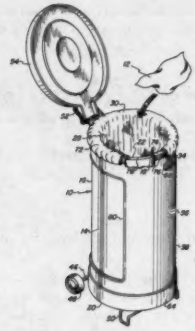


unrotatably mounted and is adjustable crosswise to said spindle shaft means (8), and wherein said second needle bearing means (11) are arranged between said carrier shaft means and said roller means to take up radial forces and said first needle bearing means (21) are arranged between said support means and said roller means to take up axial forces.

4,218,103
HAMPER

Stephen A. Bacskay, 247 Glenwild Ave., Bloomingdale, N.J. 07506

Filed Sep. 20, 1978, Ser. No. 943,957
Int. Cl.[2] A47B *81/00*; B65D *91/00*
U.S. Cl. 312—211 **17 Claims**



1. A hamper for collecting items placed therein, said hamper comprising:

a receptacle having a generally cylindrical tubular wall extending axially between opposite ends, the receptacle including a reception entrance at one of said ends and a delivery port located in said wall between the ends, the reception entrance and the delivery port both communicating with the interior of the receptacle;

a cylindrical sleeve juxtaposed with the tubular wall of the receptacle and mounted upon the receptacle for rotation relative to the tubular wall between a first position, wherein the sleeve closes the delivery port, and a second position, said cylindrical sleeve including an aperture so located therein that the aperture is registered with the delivery port for access to the interior of the receptacle when the sleeve is in the second position;

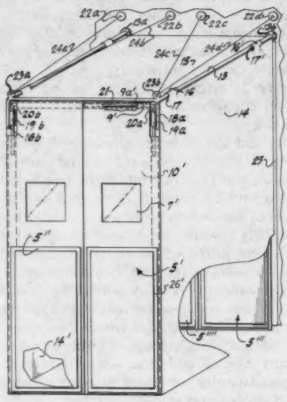
a liner having a top opening for registering with the reception entrance, a bottom, and a longitudinal length between the opening and the bottom for extending axially within the interior of the receptacle to place the bottom adjacent the other of said ends; and

attachment means for attaching the liner, adjacent the top opening thereof, to the receptacle for the reception of said items axially into the liner, said attachment means being selectively releasable to enable removal of the liner, with said items therein, laterally through the registered delivery port and aperture when the sleeve is in the second position.

4,218,104
REFRIGERATION INSULATION PANEL AND STRUCTURE

Arnold N. Anderson, 6 Wyoming Dr., and Gerard Crennan, 1 Indian Hill Ct., both of Hazlet, N.J. 07730

Filed Feb. 16, 1979, Ser. No. 12,960
Int. Cl.[3] E01F *13/00*; E04C *2/00*; F25D *11/00*
U.S. Cl. 312—214 **24 Claims**

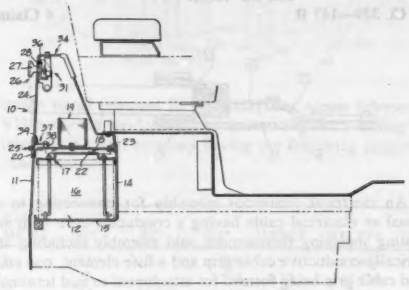


1. A refrigeration insulation panel device comprising in combination: a first set of at least two elongated flexible sheets have predetermined toughness sufficient to withstand major impacts without puncturing or tearing, each flexible sheet having opposite substantially planar side faces, said two flexible sheets being aligned and sandwiched with each flexible sheet having one of its planar side faces in opposed and parallel relationship to the other sheet's planar side face; an insulation rubber sheet being sandwiched and anchored between the opposed planar side faces, said insulation rubber sheet being closed-cell rubber, and said flexible sheets each comprising Nylon fabric coated with synthetic rubber, and including a flexible bumper strip attached to and suspended downwardly at said lower end; and a flexible bumper strip attached to and suspended downwardly at said lower end, the flexible bumper strip being mounted on top of an exposed exterior one of said planar side faces on each of said sandwiched flexible sheets covering substantially a lower half of said one of said planar side faces, an exposed side planar face of said flexible bumper strip having a cut-groove spaced from and following the circumscribing edge thereof, said flexible bumper strip being attached to said one of said planar faces by stitching recessed within said cut-groove adapted such that impacting objects onto said exposed side planar face of said flexible bumper strip, is protected against wear and breakage by impact from the impacting objects.

4,218,105
SOUND SUPPRESSED BATTERY BOX

Conard E. Leighty, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1978, Ser. No. 936,989
Int. Cl.[2] B62D *25/00*; A47B *81/00*
U.S. Cl. 312—291 8 Claims



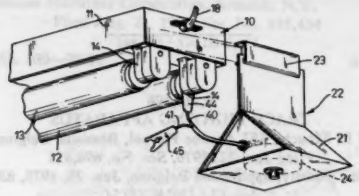
1. A sound suppressed storage box (10) comprising
a plurality of panels (11-15) defining a storage compartment therein,
a horizontally disposed cover (18) disposed over said compartment,
support means (20-23) secured to at least one of said panels for supporting said cover over said compartment,
a vertically disposed door (24) having a first end thereof pivotally mounted on one of said panels adjacent to said compartment for movement between open and closed positions,
latch means (26), mounted adjacent to a second end of said door (24) opposite to the first end thereof, for selectively locking said door (24) in its closed position on said storage box (10), and
sound suppression means (37) disposed between said cover (18) and said door (24) when said door (24) is maintained in its closed position by said latch means and extending inwardly from said door (24) in overlying relationship relative to said cover (18) for engaging and holding said cover (18) against said support means (20-23) and for attenuating noise.

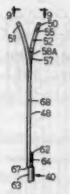
4,218,106
BIFURCATED RESILIENT PIN-ENGAGING ELECTRICAL CONNECTOR AND METHOD FOR MAKING SAME

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843

Filed Nov. 2, 1978, Ser. No. 956,911
Int. Cl.[2] H01R *11/02*
U.S. Cl. 339—32 R 16 Claims

6. In combination:
a fluorescent light fixture having a fixture terminal thereon which includes an electrically conductive pin receptable therein;
a fluorescent tube mounted on said fixture and having an electrically conductive pin at one end thereon engaged with said pin receptacle;
said one end of said tube and said fixture terminal defining a space therebetween;
and an electrical connector for insertion into said space for releasable engagement with said electrically conductive pin and for attachment to the end of an electrical conductor, said connector comprising:
an electrically conductive resilient metal plate including two coplanar oppositely displaceable prongs on opposite sides of a pair of pin-receiving apertures, said apertures being of different size and each having a narrow throat, whereby the prong edges confronting said apertures are adapted to make electrical contact with said pin disposed in either of said apertures, depending on the diameter of said pin;
said plate including one narrow throat extending from an outer edge thereof to one of said apertures; said plate further including a first slit extending between said aper-



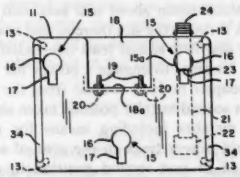


tures and a second slit extending from the innermost aperture to facilitate displacement of said prongs from their common plane to enable enlargement of said throats to accommodate passage of a pin therethrough;
and electrical insulating material on said plate but disposed so as to leave said prong edges uninsulated.

4,218,107
BATTERY PACK CONNECTION

Anton F. Wilson, White Plaines, N.Y., assignor to Anton/Bauer, Inc., Shelton, Conn.

Filed May 11, 1979, Ser. No. 38,351
Int. Cl.[3] H01R *13/62*
U.S. Cl. 339—75 P 9 Claims



1. A releasable battery pack connection comprising a relatively flat male plate and a relatively flat female plate, said plates being adapted to be releasably locked together in connected position; said female plate including a plurality of through keyholes with each having a circular opening and a depending slot, and at least one elongate terminal, said terminal and keyhole slots being elongate in the same direction; said male plate including a plurality of spaced headed projections with there being one for each keyhole and with each projection having head and leg portions, and at least one elongated mating terminal; said male plate being positioned abutting the female plate with the legs of the projections being located in the slots of the associated keyholes and with the one terminal

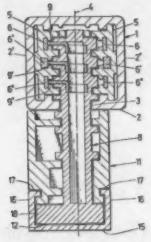
within the mating terminal, and releasable locking means on one of said plates for engaging means on the other of said plates to lock said plates in connected position by preventing relative movement between said plates in the direction of said keyhole slots until said locking means is released.

4,218,108

TRACK LIGHTING APPARATUS

Daniel El Mouchi, 152 Avenue Floreal, Brussels, Belgium

Filed Jun. 22, 1976, Ser. No. 698,571
Claims priority, application Belgium, Jun. 25, 1975, 830637
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—82 **7 Claims**



1. For use in combination with an electrical power track of the type comprising a longitudinally extending housing having a longitudinal slot opening in one face thereof and containing within the housing at least one longitudinally extending continuous electrical conductor bar which is laterally spaced from the center of said slot opening, a selectively actuable electrical coupling device for a power consuming load comprising:

a connecting component body;

an insulative adapter member having a longitudinal axis and being disposed within and supported by said body for bidirectional rotation about said axis, said adapter member having a first end which extends substantially from and outside of the boundaries of said connecting component body and is of such dimension as to be insertable, in a first angular position taken about said axis, into an electrical power track through the slot therein, said adapter member carrying at said first end at least one radially projecting conductive terminal to engage a power bar in said track when the adapter body is rotated from the first angular position to a second angular position taken about said axis;

said adapter member including means for mechanically engaging said power track in the area of said slot only when rotated to said second position to maintain the adapter member in the inserted position;

the other end of said adapter member including means for rotating said adapter member about said axis relative to the connecting component body to electrically engage the terminal with the power bar;

outlet means on the connecting component body;

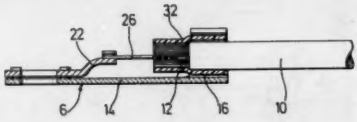
and selector switch means carried by said connecting component body adjacent but spaced from said other end of said adapter member for selectively electrically connecting the terminal with the output means when the adapter member is in said second angular position, the apparatus further including means for locking said adaptor member in the second annular position whenever said selector switch means electrically connects said terminal with the output means thus to ensure maintenance of the contact between the terminal and the electrical conductor bar.

4,218,109

ELECTRICAL CONNECTOR ASSEMBLY

Max B. Kneusels, Secheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1978, Ser. No. 964,194
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754581
Int. Cl.² H01R *15/16*
U.S. Cl. 339—147 R **6 Claims**



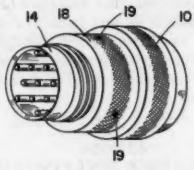
1. An electrical connector assembly for connecting to a terminal an electrical cable having a conductor core with an insulating sheathing therearound, said assembly including an electrically conductive cable grip and a fuse element, one end of said cable grip being formed for attachment to said terminal and the other end being formed for connection to the insulating sheathing of said conductor, and one end of said fuse element being connected to said cable grip and the other end of said fuse element being formed for engagement with the core of said conductor.

4,218,110

CONNECTOR-TO-CONNECTOR ADAPTOR

Joseph J. Giannaula, Ladson, S.C., and Kenneth P. Reever, Pittsfield, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1979, Ser. No. 26,982
Int. Cl.² H01R *23/02*
U.S. Cl. 339—154 A **5 Claims**



1. A connector-to-connector adaptor for positively mating a first connector to a mismatched second connector comprising:

(a) an adaptor shell having a first means for engaging said first connector and having a second means for engaging said second connector; and

(b) a plurality of contacts contained within said adaptor shell, each of said contacts having a pin end to enter openings of said first connector and having a socket end to enter openings of said second connector to form the contacts for both said first and said second connectors.

4,218,111

HOLOGRAPHIC HEAD-UP DISPLAYS

Roger J. Withrington, Los Angeles; Lacy G. Cook, Hawthorne, and Helene H. Jones, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 10, 1978, Ser. No. 923,119
Int. Cl.² G02B *27/00*
U.S. Cl. 350—3.72 **1 Claim**

1. In a head-up display system of the type including a source of optical image signal, relay lens means for relaying said optical image signal to a holographic element positioned and

used as a combiner lens so that the user may see both said optical image signal projected to said holographic optical element and the external world through said holographic element, optical elements comprising said source of optical

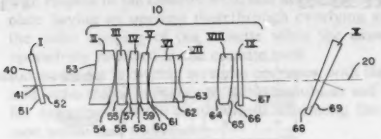


image signal (element I), said relay lens means (elements II-VIII), a notch bandpass filter (element IX) and a folding prism (element X), said elements having the following prescription characteristics:

ELEMENT	SURF NO.	RD	TH*	INDEX	TILT**	DEC**
I	51	∞	.250	1.517	12.496	0
	52	∞	3.503	AIR	12.496	.054
II	53	−34.998	1.410	1.785	−9.906	.731
	54	−5.687	.084	AIR	−9.906	.488
III	55	26.795	.725	1.785	1.943	.246
	56	−19.482	.050	AIR	−1.943	.222
IV	57	13.723	.656	1.785	−1.943	.220
	58	289.330	.050	AIR	−1.943	.198
V	59	6.940	.570	1.785	−1.943	.196
	60	15.616	.050	AIR	−1.943	.177
VI	61	3.355	1.834	1.607	−2.728	.175
	62	−8.042	.170	1.728	−1.943	.113
	63	1.926	2.625	AIR	−1.943	.107
VII	64	5.727	1.056	1.620	−6.147	.478
	65	−11.880	.179	AIR	−6.147	.365
VIII	66	∞	.250	1.517	0	0
	67	∞	5.344	AIR	0	0
IX	68	∞	.437	1.522	−22.316	0
	69	∞	/	/	−26.482	−.166

*Glass thicknesses are measured along the axis of the first surface of the lens; air thicknesses are measured along an arbitrary reference line 20.

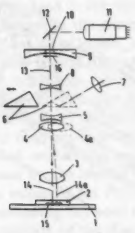
**Surface tilts and decenters are relative to line 20. Decentration applies prior to tilt. Tilt is specified in angular deviation from the normal to line 20. Decentration is specified along the normal to line 20.

4,218,112

PHOTOMETER MICROSCOPE FOR MICROPHOTOMETER SCANNING OF FINE SPECIMEN STRUCTURES

Otto Ruker, Vienna, Austria, assignor to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Jul. 3, 1978, Ser. No. 921,633
Int. Cl.³ G02B *21/00*
U.S. Cl. 350—8 **5 Claims**



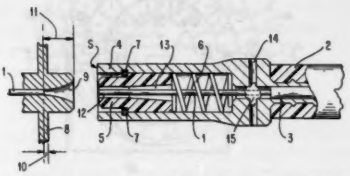
1. A scanning system for a microscope which comprises, a pair of lenses on an optical axis each of said pair having equal and opposite power, one of said pair being movable in a plane normal to the optical axis, a gimbal mounted joy-stick to control movement of said one of said lenses.

4,218,113

OPTICAL FIBER CONNECTOR APPARATUS

Edward C. Uberbacher, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,434
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.21 **5 Claims**



1. Optically transmissive fiber connector apparatus, comprising:

a housing means having a central axial cavity extending therethrough;

at least one optically transmissive fiber having a free end thereof inserted into said cavity at one end thereof and extending outward therefrom at the other end thereof;

means for affixing said fiber to said housing with the free extending end of said fiber at a fixed and controlled distance from a reference surface on said housing;

a longitudinally slidable fiber support and shroud means surrounding and slidingly supporting at least the free end of said fiber extending from said housing;

resilient mounting means in contact with said sliding support and shroud means for urging said support and shroud means outward from said housing;

a connector means having a flared aperture therethrough, said flared aperture having at least one surface opening of a dimension greater than that of said aperture at a point within said connector along the axis of said aperture, said aperture receiving and guiding said free end of said fiber which extends outward from said housing;

said connector having means for abutting said sliding support and shroud means and forcing the same backward against the urging of said resilient means when said housing and shroud assembly are brought into engagement with said connector, the wall surfaces of said flared aperture contacting and guiding the free end of said fiber into accurate placement at the center and on the axis of said aperture.

4,218,114

HELIOSTAT APPARATUS

Jesse C. Bunch, 1008 Kerwin Rd., Silver Spring, Md. 20901

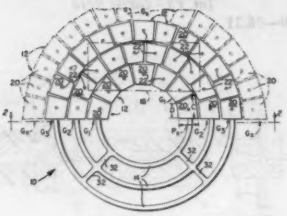
Division of Ser. No. 642,473, Dec. 19, 1975, Pat. No. 4,110,009.
This application Apr. 3, 1978, Ser. No. 892,960
Int. Cl.³ G02B *5/08*
U.S. Cl. 350—292 **23 Claims**

1. Heliostat apparatus for concentrating solar energy comprising support means disposed in a first plane and supporting a plurality of mirror units having freedom of substantial universal articulation thereon,

each of said plurality of mirror units carrying at an upper portion thereof reflective means trained to receive incident rays of the sun and to maintain reflection thereof in a desired substantially fixed direction, said plurality of mirror units are arranged in a plurality of groups with at least a first group including a number of mirror units situated along a first arcuate path and a second group including a

number of mirror units situated along a second arcuate path generally concentric to said first arcuate path,

adjustment means operatively connected to said plurality of mirror units and disposed in a plane generally parallel to said first plane in which said support means are disposed, said adjustment means being shiftable in linear displacement to additional planes adjacent and generally parallel



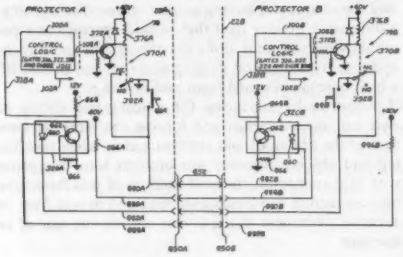
thereto to effect substantially universal displacement of each of said mirror units responsive to said linear displacement of said adjustment means at said support means thereby conjointly retrain the reflective means of each of said mirror units to receive incident rays of the sun and maintain reflection thereof in said substantially fixed direction over the course of any day.

4,218,115

CHANGEOVER CONTROL ARRANGEMENT FOR PROJECTION APPARATUS

Robert R. Parker, Wheeling, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 8, 1979, Ser. No. 1,995
Int. Cl.[3] G03B *31/00, 21/34*
U.S. Cl. 352—7 **22 Claims**



1. A changeover control arrangement for a projector having operational enabling circuitry controllable between an enabled and disabled mode of projection over a control line, said changeover control arrangement comprising:

photosensitive control means associated with said projector for controlling the enabled and disabled projection modes of said projector over said control line;

activating means electrically isolated from said photosensitive control means and said projector electrical and ground reference system disposed to activate said photosensitive control means when energized over a circuit path provided over a first external output connection of said projector; and

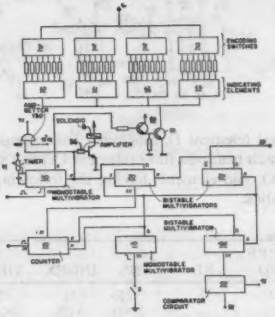
changeover control means for initiating and maintaining a circuit path upon operation over a second external output connection of said projector when said second external output connection is connected to an externally connected load.

4,218,116

EQUIPMENT IN FILM CAMERAS

Fritz G. Bauer, Loquaiplatz 13, A-1060 Vienna, Austria

Filed Nov. 17, 1978, Ser. No. 961,702
Int. Cl.[2] G03B *31/00*
U.S. Cl. 352—22 **4 Claims**



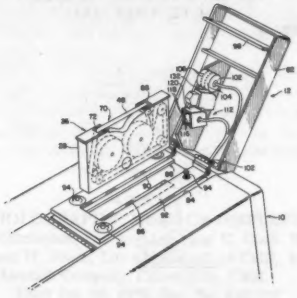
1. An accessory apparatus for producing visible information on a film in a moving picture camera having a standard picture frequency by exposure of the film through optical indicating elements, which comprises an actuating circuit arrangement for the optical indicating elements, the circuit arrangement including a driving circuit for actuating the indicating elements and a control circuit associated with the driving circuit, the driving circuit being responsive to the control circuit and the control circuit being controllable in response to the picture frequency, the control circuit comprising an electrical signal transmitting stage, a signal recording stage connected to the transmittting stage and directly receiving the signal therefrom, the driving circuit and the signal transmitting stage being energizable simultaneously, and a blocking circuit stage de-energizing the control circuit after passage of a pre-selectable number of picture frames after the standard picture frequency has been reached.

4,218,117

AUDIO SYSTEM VIBRATION ISOLATION ARRANGEMENT FOR PHOTOGRAPHIC VIEWER

Richard V. Fischer, West Warwick, R.I., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1979, Ser. No. 33,022
Int. Cl.[2] G03B *23/02*
U.S. Cl. 352—72 **1 Claim**



1. A sound accessory for a motion picture player, the player comprising a cassette well configured for receiving a cassette which includes a flexible audio strip extended along a given

path within the cassette to an audio opening thereof, said sound accessory comprising:

an accessory mounting plate for engaging a locating portion of the player for locating said accessory mounting plate with respect to the cassette well, said accessory mounting plate having an opening therethrough overlying at least the audio opening of the cassette when the cassette is operatively received in the cassette well;

audio means for providing an audio operation with the tape, said audio means including an audio transducer and means for engaging and for continuously advancing the audio tape across said transducer;

an audio component plate for mounting said audio means; and

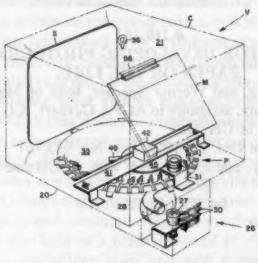
means for mounting said audio component mounting plate in overlying relationship to said accessory mounting plate with said audio means in operative relation to the audio opening of the cassette when the cassette is operatively received in the cassette well so that said engaging means will advance the tape across said transducer, said means for mounting comprising means for effecting vibration isolation between said accessory mounting plate and said audio component mounting plate.

4,218,118

SLIDE VIEWING APPARATUS

James E. Orr, San Antonio, Tex., assignor to Visual Sales Corporation, San Antonio, Tex.

Filed May 2, 1978, Ser. No. 902,040
Int. Cl.² G03B *23/10*
U.S. Cl. 353—110 **8 Claims**



1. An automatic slide viewing apparatus, comprising:

an enclosure with a projection screen mounted with the enclosure for viewing images projected from transparencies;

a rotating disc mounted for rotation about a generally vertical axis within the enclosure and having a plurality of transparency holders for mounting transparencies about the periphery of the disc;

a light and lens mounted in the enclosure for projection of a transparency image on the screen;

a plurality of index cogs, each having inclined camming surfaces mounted on the disc and a rotating drive wheel means having drive pins for engaging the inclined camming surfaces of the index cogs to rotate the disc in the increments to selectively align a transparency holder for a predetermined time between the light and lens;

a mirror mounted within the enclosure for reflecting the image projected by the lens to the projection screen;

a shutter means mounted for rotation with the drive wheel means for positioning between the lens and light for each incremental rotation of the disc;

the drive pins are rollers for smooth engaging and releasing of the index cogs; and

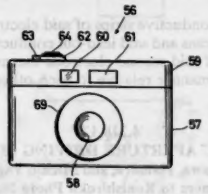
the shutter means includes a plurality of opaque blades mounted on the drive means for sequentially positioning between the lens and light.

4,218,119

SYSTEM FOR CONTROLLING THE EXPOSURE IN A CAMERA

Willi Schickedanz, Offenbach am Main, Fed. Rep. of Germany, assignor to Canon, Inc., Tokyo, Japan

Filed Aug. 29, 1978, Ser. No. 937,738
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738804
Int. Cl.² G03B *7/08, 13/20, 19/12;* G01P *3/36*
U.S. Cl. 354—23 D **24 Claims**



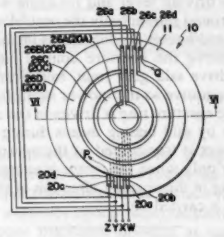
1. A system for controlling the exposure in a camera, comprising means for checking the object field to be photographed for the presence of at least one moving object in said field and for producing an electric signal indicative of such presence, said checking means generating at least two successive outputs; means for detecting the amount of relative movement between the camera and object in said field based upon said at least two successive outputs of said checking means, said detecting means including means for storing a first one of said outputs and means for comparing a successive one of said outputs with the stored first output, said detecting means producing an output indicative of said relative movement; and means for setting the camera-shutter speed and operating the camera shutter as a function of said relative movement based upon said output of said detecting means.

4,218,120

ELECTROCHROMIC LIGHT REGULATOR

Kunio Kawamura; Mitsuo Yasukuni; Takashi Iida, all of Sakai, and Yuziro Suzuki, Izumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Jan. 8, 1979, Ser. No. 1,781
Claims priority, application Japan, Jan. 17, 1978, 53-3977
Int. Cl.² G03B *9/56*
U.S. Cl. 354—227 **7 Claims**



1. An electrochromic light regulator which comprises, in combination:

first and second electrochromic layers arranged in alignment with each other on the same optical path;

a first electrode means constituted by a plurality of transparent electrodes disposed adjacent to said first electrochromic layer for controlling coloration of said first electrochromic layer, said electrodes of said first electrode means being arranged in a first predetermined pattern and electri-

cally insulated from each other, said electrodes of said first electrode means having respective lead-out conductive strips extending outwards therefrom;

a second electrode means constituted by a plurality of transparent electrodes disposed adjacent to said second electrochromic layer for controlling coloration of said second electrochromic layer, said electrodes of said second electrode means being arranged in a second predetermined pattern and electrically insulated from each other, said electrodes of said second electrode means having respective lead-out conductive strips extending outwards therefrom; and

said lead-out conductive strips of said electrodes of said first electrode means and said lead-out conductive strips of said electrodes of said second electrode means being arranged in an offset manner relative to each other.

4,218,121

AUTOMATIC APERTURE DRIVING MECHANISM

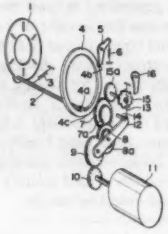
Yasutsugu Nakagawa, Hamura, and Michio Yagi, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,530

Claims priority, application Japan, Nov. 29, 1977, 52/142257

Int. Cl.[2] G03B *9/02*

U.S. Cl. 354—271 **4 Claims**



1. In an automatic aperture driving mechanism for a camera comprising an aperture ring, an aperture driving lever operatively connected to the aperture ring at one side thereof, biasing means for biasing the aperture ring in the closing direction of the aperture, and holding means for holding the aperture ring at the fully opened position of the aperture against the biasing means, the improvement characterized by comprising an aperture control ring operatively connected to one portion of the aperture driving lever and rotatable with the aperture driving lever around substantially the optical axis of the photographing lens, and a reset driving means including a gear train connected to drive the aperture control ring and a motor connected to drive said gear train, said gear train including clutch means operative so that power is not transmitted to the motor when the aperture ring is driven in the closing direction of the aperture by said biasing means during photographing, but so that power is transmitted to the aperture control ring from the motor only when the motor is energized for moving the aperture ring in the opening direction of the aperture after photographing is carried out.

4,218,122

LIGHT-HANDLE

Jack W. Drafahl, Jr., 5572 Nelson, Cypress, Calif. 90360

Filed Jul. 30, 1979, Ser. No. 62,238

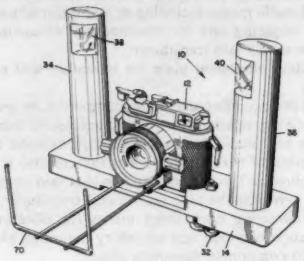
Int. Cl.[3] G03B *17/00*

U.S. Cl. 354—293 **10 Claims**

1. A structure for providing camera support, photographic illumination and manual graspability for pointing the camera and the illumination for use in underwater environment comprising:

a crossbar, said crossbar being for supporting a camera thereon and for securement of a camera thereon, a synchronization connector on said crossbar for connection into a camera on said crossbar;

a post on said crossbar, said post having a strobescopic light tube therein and having a window therein for permitting stroboscopic light to be emitted from said window, electrical connection between said synchronization camera



connector and said stroboscopic light tube so that, upon demand by the camera, said stroboscopic light is fired, said post being rigidly secured on said crossbar and being sized for manual grasp, said post being positioned with respect to the camera so that, when said post is grasped in the hand, a finger can reach the camera for firing the camera.

4,218,123

MACHINE FOR DEVELOPING PHOTOGRAPHIC PAPER OR THE LIKE

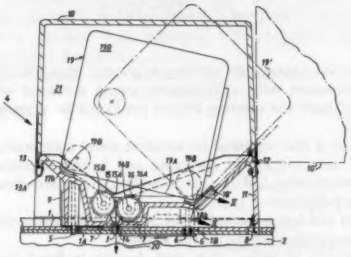
Wolfgang Viehrig, and Werner Sperber, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,757

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748480

Int. Cl.[2] G03D *16/06*

U.S. Cl. 354—310 **20 Claims**



1. In a machine for developing exposed phtotographic paper or like webs of photographic material which is stored in cassettes, apparatus for withdrawing webs from cassettes comprising a feed table having a channel for the passage of a web therethrough; means defining a chamber at one side of said table; and an adapter adjacent to the other side of said table, said adapter comprising a housing having an aperture communicating with said channel and defining a compartment for reception of different types of cassettes having different dimensions, and holding means for holding said different types of cassettes within said compartment in respective positions thereof relative to said aperture which are proper for withdrawal of the respective webs therefrom into said aperture,

including two holding portions respectively situated at opposite sides of said aperture, at least one of said holding portions having a stepped configuration to form a plurality of recesses each of which has a width substantially corresponding to that of a region of a cassette of one of said different types which is received therein in the respective proper position.

4,218,124

PHOTO-SENSITIVE SCREEN FOR PRODUCING ELECTROSTATIC LATENT IMAGE

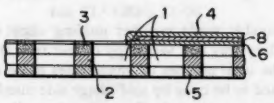
Sohji Shinozaki; Yoshiaki Takei, and Haruo Iwahashi, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 960,835

Claims priority, application Japan, Nov. 22, 1977, 52-140115

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 SC **12 Claims**



1. A photo-sensitive screen for producing an electrostatic latent image within an apertured region in which a plurality of fine apertures are formed with a uniform distribution from a multi-layer structure, said structure comprising a photo-conductive insulative layer, an electrically conductive substrate, a second insulating layer and an electrically conductive layer superimposed in that order, in combination with means forming a solid nonapertured area of insulating material on said screen outside of the active apertured region thereof, and a lead conductor connected to said electrically conductive layer within said nonapertured area, whereby upon application of a bias voltage to said conductive layer through said lead conductor, an electric field of a predetermined profile is formed between said conductive layer and said conductive substrate separated by said interposed second insulating layer.

4,218,125

PNEUMATIC SYSTEM FOR SUPPORTING A PHOTOCONDUCTIVE SURFACE

Morton Silversberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 20, 1978, Ser. No. 953,310

Int. Cl.[2] G03G *15/00*

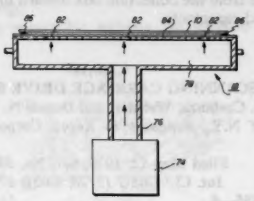
U.S. Cl. 355—3 BE **12 Claims**

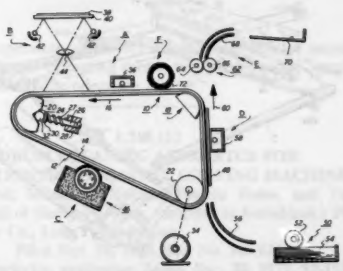
1. An apparatus for supporting a belt arranged to move in a pre-determined path, including:

at least one post positioned to have the belt move thereover;

means for supplying pressurized fluid between at least a portion of said post and the belt to form a fluid film at least partially supporting the belt and reducing friction between the belt and said post;

a pair of opposed, spaced resilient members with each of said pair of members being secured to said post and in sliding contact with opposed side marginal regions of said belt for sealing the space between opposed side marginal portions of the belt and said post to substantially reduce fluid leak-





age thereat while maintaining sliding friction between said belt and said pair of resilient members at a minimum; and means for moving the belt in the pre-determined path.

4,218,126

DEVELOPER COLLECTION DEVICE FOR A COPYING MACHINE

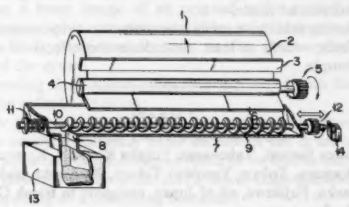
Fujio Takeichi, Hokkaido, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 2, 1979, Ser. No. 26,168

Claims priority, application Japan, Apr. 19, 1978, 53/51605[U]

Int. Cl.[2] G03G *15/00, 21/00*; G08B *21/00*

U.S. Cl. 355—3 R **4 Claims**



1. A developer collection device for a copying machine, comprising a photosensitive drum, a removing mechanism for removing developer remaining on the surface of the photosensitive drum after a transfer operation is completed, a receptacle having a developer discharge opening at one end portion thereof and adapted to receive the developer removed by the removing mechanism, a shaft rotatably supported in the receptacle and movable in the axial direction thereof, said shaft having a spiral blade at the outer peripheral surface thereof, urging means for urging the shaft, a developer collection box detachably attachable to the developer discharge opening of the recepticle, and a sensor which is rendered ON when said shaft is moved in a direction opposite to the direction of conveyance of the developer into abutment therewith, the movement of the shaft in that direction being affected against an

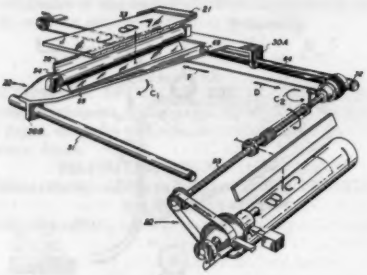
urging force of said urging means when an excess load is applied to the spiral blade of said shaft due to an overflow of the developer from the collection box toward the discharge opening of said receptacle.

4,218,127

SCANNING CARRIAGE DRIVE SYSTEM

Daniel W. Costanza, Webster, and Dennis N. Muck, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 11, 1979, Ser. No. 38,163
Int. Cl.³ G03G *15/28*; G03B *27/48*
U.S. Cl. 355—8 **1 Claim**



1. In a copying device in which an original to be copied is supported in a stationary condition upon a flat viewing platen and a flowing light image of the original is recorded upon a moving photosensitive plate, said copying device including:

a scanning carriage having optical scanning components mounted thereon and movably positioned on a pair of guide rails below said platen;

means for driving said carriage in a horizontal plane so as to scan successive areas of said original and at scan rates which create at the start of scan a first force couple acting in the plane of carriage travel and tending to impart a rotary motion to said carriage;

drive means including a drive cable entrained about a drive pulley mounted adjacent an inboard guide rail and an idler pulley, said idler pulley having a vertical dimension inclined at an angle of less than 90° with respect to said horizontal plane,

whereby said drive cable is tensioned so as to create a second force which at least neutralizes the effects of said first couple.

4,218,128

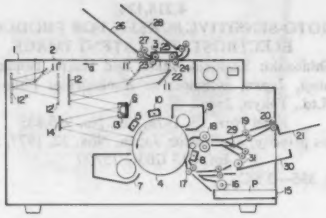
DUPLEX COPYING MACHINE

Toyokazu Satomi, Yokohama; Yutaka Koizumi, Kawasaki; Isao Nakamura, Tokyo; Yasuhiro Tabata, Kawasaki, and Tamaki Kaneko, Fujisawa, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jan. 10, 1978, Ser. No. 868,442
Claims priority, application Japan, Jan. 11, 1977, 52/1644; Jan. 31, 1977, 52/9479; Mar. 17, 1977, 52/29457; Mar. 22, 1977, 52/31360
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 SH **14 Claims**

1. In a duplex copying machine of the type having a contact glass for placing an original document thereon, a photoconductive member, charging means for imposing a uniform electrostatic charge on the photoconductive member, exposure means for forming a latent electrostatic image corresponding to an image to be reproduced, developing means for bringing transferable toner into contact with the photoconductive member to render the latent electrostatic image a transferable toner image, transfer means for transferring the toner image from the photoconductive member to a copy sheet, image fixing means for affixing the toner image to the copy sheet, a primary tray for holding a supply of copy sheets, a secondary tray for holding one or more copy sheets having an image transferred from the photoconductive member to one side thereof, a copy output tray, copy paper transport means connecting the three trays, and a swingable guide member which selectively guides copy sheets into the secondary tray or into the copy output tray, the improvement comprising:

image side number indicating means for indicating whether the total number of image sides of original documents to be reproduced is odd or even,



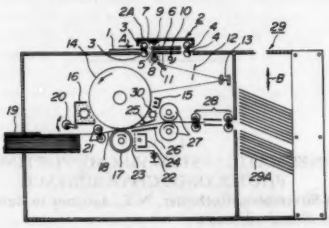
said swingable guide member guiding copy sheets to said secondary tray and said copy output tray alternatively in case the total number of image sides to be reproduced is indicated to be even by said image side number indicating means, and guiding the first copy sheet directly into said copy output tray after one-side copying in case the total number of image sides to be reproduced is indicated to be odd by said image side number indicating means, and thereafter guiding copy sheets to said secondary tray and said copy output tray alternatively.

4,218,129

ELECTROPHOTOGRAPHIC APPARATUS

Osamu Ishimoto; Masaji Nishikawa, and Masaru Yamazaki, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 4, 1978, Ser. No. 903,029
Claims priority, application Japan, May 6, 1977, 52-51281
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 SH **5 Claims**



1. An electrophotographic apparatus for forming a number of duplicated copies from each of sheet-like documents comprising: means for feeding said sheet-like document at a constant velocity through an exposing and scanning position; optical means fixed in said apparatus for exposing and scanning the sheet-like document at said position, which the sheet-like document is forwarded at the constant velocity by said feeding means; means for forming an imagewise-modulated pattern corresponding to an image of the sheet-like document during a single exposing and scanning process, and retaining the imagewise-modulated pattern thus formed; means for forming a given number of duplicated copies from the retained image-

wise-modulated pattern; means for generating a signal in accordance with the duplicating operation for forming the given number of copies of a sheet-like document; and means for receiving said signal and controlling said document feeding means so as to retain a next sheet-like document at a stand-by position during the duplicating operation for forming the given number of copies of the previous document and to initiate the feed of the next document after a time when the imagewise-modulated pattern of the previous document can be erased at the end of the duplicating operation for forming the given number of copies of the previous document.

4,218,130

METHOD FOR CONTROLLING A COPYING APPARATUS ADAPTED TO PRINT IMAGES ON OPPOSITE SURFACES OF A COPY SHEET

Toyokazu Satomi, Yokohama; Yutaka Koizumi, Kawasaki; Seiichi Miyakawa, Nagareyama; Isao Nakamura, Tokyo; Yasuhiro Tabata, Kawasaki, and Tamaki Kaneko, Fujisawa, all of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Aug. 4, 1978, Ser. No. 931,398

Claims priority, application Japan, Aug. 9, 1977, 52-94646; Aug. 31, 1977, 52-103592

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R **13 Claims**

1. A method for sequentially copying a plurality of successive pages of a book original on a copying apparatus capable of printing images of pages on both sides of a copy sheet comprising the steps of opening the book original at the desired pages and placing said open book faced downwardly on the original placing plate of a copying apparatus, inputting a selected page signal to the copying apparatus depending upon whether the first page and last pages of the desired sequence of pages of the book original to be copied is an odd-number or even number, inputting a book binding signal to the copying apparatus depending on whether the book original is a left bound book or a right bound book, and controlling the timing for feeding the copy sheets in accordance with the selected page signal input to said copy machine whereby a page image is printed on one side only of the first copy and both sides of all the succeeding copy sheets when said first and last page to be copied is odd-odd or even-even respectively and whereby a page image is printed on either side of all copy sheets when the first and last pages to be copies is odd-even or even-odd respectively.

4,218,131

CLEANING DEVICE

Yoshio Ito; Katuhiko Yamada; Tadayuki Kitajima, all of Yokohama; Koichi Miyamoto, Tokyo; Hiroo Kobayashi, Tokyo, and Yoshikuni Tohyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 648,821, Jan. 13, 1976, abandoned. This application Aug. 17, 1978, Ser. No. 934,688

Claims priority, application Japan, Jan. 17, 1975, 50-7528

Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—15 **21 Claims**

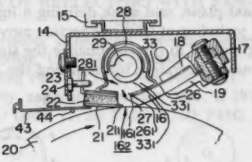
1. A cleaning device for removing developer remaining on the surface of an image bearing member comprising:

cleaning means having a resilient cleaning blade member disengageably contactable with the surface of the image bearing member;

guide means having a guide member which cooperates with said resilient cleaning blade member to form a slit-like opening;

shutter means having a shutter member movable to the slit-like opening;

blade operating means for moving the resilient cleaning blade; and



shutter operating means for moving said shutter member, said shutter operating means being disposed to interfere with said blade operating means.

4,218,132

DRUM CLEANING APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

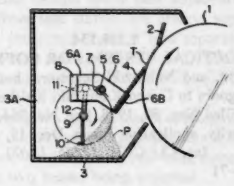
Fumio Iwai; Masakazu Kokiso; Junichi Koiso, and Tamio Ogino, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 965,024

Claims priority, application Japan, Dec. 20, 1977, 52-152448

Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—15 **3 Claims**



1. An apparatus for cleaning a rotating drum surface for producing a toner image of an original to be copied in an electrophotographic copying machine, comprising a toner scraping blade positioned to bear on the outer cylindrical surface of the drum;

a supporting shaft means extending in parallel with the axis of the cylindrical drum;

a toner guide chute plate having an upper edge caused to bear on the cylindrical outer surface of the drum below and upstream of the scraping blade as viewed in the rotating direction of the drum and a lower edge positioned at an opening of a collecting container;

means for holding said toner guide chute plate on said supporting shaft means with play; and

means for applying shocks on the toner guide chute plate through the supporting shaft means.

4,218,133

PHOTOGRAPHIC COPYING APPARATUS

Ernst Biedermann, Taufkirchen, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1978, Ser. No. 933,826

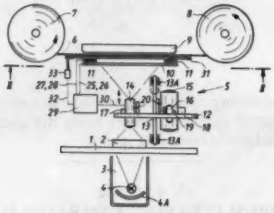
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738236

Int. Cl.[2] G03B *27/34, 27/40*

U.S. Cl. 355—56 **16 Claims**

1. Apparatus for reproducing images of originals on photosensitive material, comprising means for positioning a sheet of photosensitive material in a predetermined plane; a source of

copying light; variable-focus optical means for imaging light issuing from said source onto the photosensitive material in said plane in the form of a light beam the outer boundaries of which are determined by the position of the focus of the optical means a composite mask disposed intermediate said optical means and said plane, said mask defining a light-transmitting opening and including at least one section movable between a plurality of positions to thereby change the size of said opening; motor means operative for adjusting the position of the



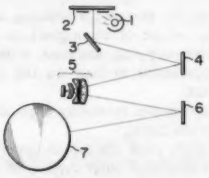
focus of said optical means with attendant change in cross section of the light beam at said composite mask; and control means for operating said motor means as a function of the selected position of said section, said control means including at least one light-sensitive signal generating element which shares the movements of said section and respectively generates and ceases to generate signals during those stages of adjustment of said optical means when said optical means respectively images and does not image light upon said element.

4,218,134

OPTICAL SYSTEM FOR COPIER

Osamu Kamiya, and Nobuyuki Sekimura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 964,986
Claims priority, application Japan, Dec. 19, 1977, 148518/77
Int. Cl.[2] G03B *27/76, 15/00*
U.S. Cl. 355—71 **12 Claims**



1. An optical system for use in a copier comprising:
a halogen lamp;
a CdS photosensitive member; and
a reflective projection lens system comprising a lens and a reflective surface, including a multi-layered interference coating formed on a substrate, provided behind said lens, said interference coating being a 5- to 9- layered structure composed of alternately superposed high refractive layers and low-refractive layers each of a basic optical thickness equal to $\frac{1}{4}$ of a design wavelength λ_0 and including therein two and one adjusting layers at the substrate side and the air side, respectively, of said coating to prevent reflection in the near-infrared wavelength region to thereby match the spectral characteristics of the light reflected from an original with the spectral sensitivity of said photosensitive member, wherein the optical thickness ND_i of an i-th layer counted from the substrate side satisfies the following relation:

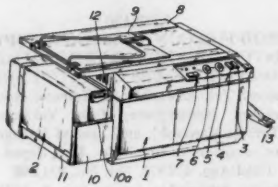
$$ND_n < ND_1 < ND_2 < ND_3 = \ldots = ND_{n-1}.$$

4,218,135

ROLL SHEET CASSETTE LOADING APPARATUS

Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita, Hachioji; Katsuhiko Kimura, Hachioji; Heihachi Arima, Hachioji, and Osamu Ishimoto, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1978, Ser. No. 918,822
Claims priority, application Japan, Jun. 24, 1977, 52-74967; Jun. 24, 1977, 52-74968
Int. Cl.[2] G03B *27/58;* **G11B** *15/29*
U.S. Cl. 355—72 **18 Claims**



1. A roll sheet cassette loading apparatus comprising: a cassette retaining member attached in a movable fashion in a copying machine body, adapted to selectively assume first and second positions for removably supporting said cassette; a flat operation member pivotally mounted on one end of said cassette retaining member, adapted to be selectively turned to an open position and a closed position; and cam means for turning said cassette retaining member between said first and second positions in response to the movement of said operation member to said open and closed positions; whereby, when said operation member is turned to said closed position, said cassette retaining member assumes said first position so as to maintain said roll sheet in said cassette in said first condition for providing said roll sheet in readiness for advance, and when said operation member is in said open condition, said cassette retaining member is turned to said second position by said cam means, to bring said roll sheet into a second condition in which mounting and removal of said cassette in and out of said copying machine body occurs; and said operation member being formed as a flat plane together with said cassette retaining member, to allow mounting and removal of said cassette when said operation member assumes said open position

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4,218,136

METHOD OF AND APPARATUS FOR ALIGNING PHOTOMASK

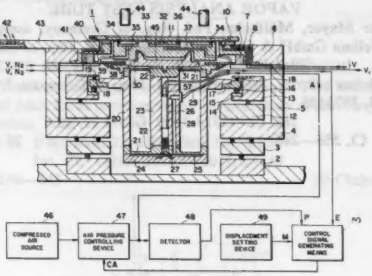
Susumu Komoriya, Tachikawa; Koyo Morita, Higashimurayama; Hiroshi Nishizuka, Kodaira, and Hisashi Maejima, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 19, 1978, Ser. No. 943,651
Claims priority, application Japan, Sep. 22, 1977, 52/113357
Int. Cl.[2] G03B *27/20*
U.S. Cl. 355—79 **10 Claims**

1. A method of making a mask and a wafer intimately contact each other by means of a mask aligning apparatus comprising a base having a chamber, a piston apparatus movable up and down in the chamber, a wafer-chuck provided at one end of the piston apparatus and adapted to fix the wafer, means for fixing the mask to the upper surface of the wafer in a superposed relationship, drive means adapted to impart a driving force to the piston, so as to move the wafer toward the mask, and means for biasing the piston apparatus in the direction to move the wafer away from the mask against the driving force, said method comprising the steps of:
bringing the wafer by a driving force of said drive means into pressure contact with the mask fixed by the fixing means, and maintaining the driving force of said drive means for the pressure contact between the wafer and the mask thereat,

sealing the wafer in an airtight manner in cooperation with the mask,

lowering the pressure of the atmosphere around the wafer below atmospheric pressure, so as to cause a bending of the mask from the fixed position, to thereby cause the



wafer to pressingly contact the central area of the mask, expelling gas from the wafer-chuck so as to make the entire region of the wafer intimately contact the mask, and

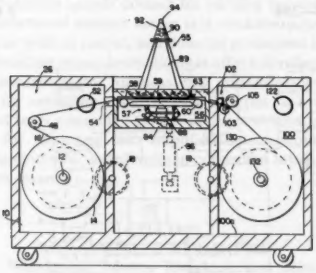
readjusting said driving force of said drive means maintained in said bringing step to a driving force below it so as to prevent the bend of the wafer and the mask.

4,218,137

ISOLATING MEMBER FOR USE IN CONTACT PRINTING

David S. Smith, Pittsford, and Leroy F. Cooley, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1979, Ser. No. 52,361
Int. Cl.[2] G03B *27/20*
U.S. Cl. 355—92 **14 Claims**



1. In apparatus for use in contact printing information from a master record carrier onto a replicate material wherein said apparatus includes means for bringing the master record carrier and the replicate material into contact, the improvement comprising:

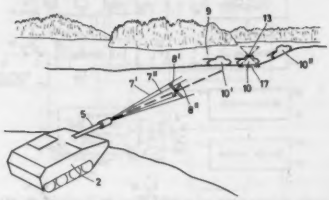
an isolating member resistant to stretch and compression disposed so as to be sandwiched between said contacting means and the contacted master record carrier and replicate material, thereby substantially isolating the contacted master record carrier and replicate material from strain forces from said contacting means.

4,218,138

METHOD AND MEANS FOR DETERMINING POSITIONS OF REFLECTORS WITH FAN-SHAPED BEAMS

Hans R. Robertsson, Jonkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linköping, Sweden

Filed Feb. 22, 1979, Ser. No. 14,117
Claims priority, application Sweden, Mar. 2, 1978, 7802348
Int. Cl.[3] G01B *11/26*; F41F *27/00*; F41G *3/26*
U.S. Cl. 356—152 **13 Claims**



1. A method of unambiguously determining the position of each of a plurality of reflectors in relation to a measuring station at the apex of a solid angle space in which the reflectors are located and from which radiation is emitted into said space, each of said reflectors being of the type whereby intercepted radiation is reflected in the direction directly opposite to the one from which it arrived at the reflector, and the reflectors being so distributed in said space that adjacent reflectors at equal distances from said station are always separated by at least a minimum projected distance in a separation direction and by no more than a maximum projected distance in a direction transverse to said separation direction, said method being characterized by:

A. emitting said radiation in the form of at least two fan-shaped beams, each of which has a long cross-section dimension and a short cross-section dimension, said long dimension of each of said at least two beams being oriented

(1) at an angle to that of the other and

(2) at an angle to said separation direction which is such that its tangent value is greater than the ratio of said maximum distance to said minimum distance; and

B. sweeping each of said two beams in a direction such that each of them moves across said space between intersection with an origin point at one side of said space and intersection with another point which is at the opposite side of said space and which is spaced in said separation direction from said origin point.

4,218,139

SOLAR ENERGY DEVICE AND METHOD

Herman E. Sheffield, P.O. Box 19781, Houston, Tex. 77024

Filed Jun. 5, 1978, Ser. No. 912,534
Int. Cl.[2] G01J *1/42*
U.S. Cl. 356—218 **5 Claims**

1. A device for measuring solar energy during a testing period, comprising:

a cell for providing an electrical signal in response to received solar energy;

A resistor connected to the cell for providing an adjusted electrical signal at a value chosen to represent a specified value of solar energy;

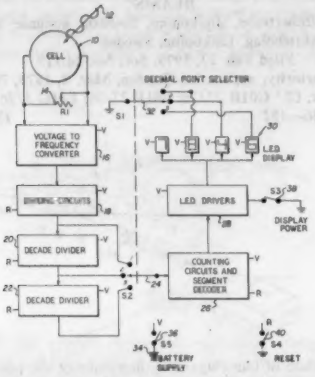
means for providing a pulse train with a frequency proportional to the adjusted electrical signal and for reducing the frequency to a number representing the amount of solar energy received by the cell;

means for dividing said signals of said pulse train selective

factors of 10 and selecting the resolution of the summed count;

means for selectively accumulating a count of the number of divided pulses in the train over a selected period of time;

means when activated for intermittently visually displaying



the number of pulses counted which represents the solar energy received by the cell during the testing period;

a battery for supplying power to the device; and

a normally open switch for activating the displaying means which are normally inactive during the testing period to conserve the life of the battery.

4,218,140

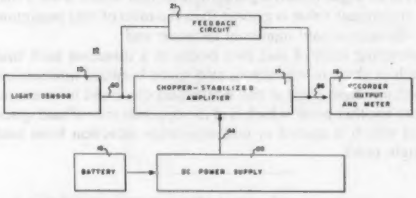
LIGHT METER

William W. Biggs, Jerome E. Johnston, and Lyle R. Middendorf, all of Lincoln, Nebr., assignors to Lambda Instruments Co., Lincoln, Nebr.

Filed Aug. 21, 1978, Ser. No. 935,553

Int. Cl.³ G01J *1/44*; G01R *19/18*

U.S. Cl. 356—226 **15 Claims**



1. A light meter comprising:

sensor means for developing an electrical signal representing radiant energy impinging upon said sensor means;

amplifier means electrically connected to said sensor means for amplifying said electrical signal without a DC potential error;

said amplifier means including conductor means for receiving a ground level signal, a positive potential and a negative potential for operation of said amplifier means;

a constant potential DC power supply for said amplifier means including a three terminal constant current source, whereby said light meter is portable;

each of said terminals of said constant current source applying a different one of said positive potential, ground level potential and negative potential to said amplifier means;

said power supply including means for developing a ground level signal;

said means for developing including an amplifier;

said amplifier means being adapted to be electrically connected to a battery pack; and

said ground level signal being developed at the output of said amplifier, whereby a center tap for the battery pack is not needed in said power supply.

4,218,141

VAPOR ANALYSIS TEST TUBE

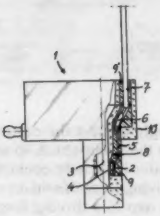
Peter Mayer, Müllheim, Fed. Rep. of Germany, assignor to Hellma GmbH & Co. KG, Müllheim, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,738

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823138

Int. Cl.² G01J *3/00*; G01N *21/00*

U.S. Cl. 356—246 **20 Claims**



1. A transparent cuvette for use in examination of media at a given temperature, particularly in photometric or spectrophotometric examination of media, comprising wall means configured to define a cavity on an inner side thereof for receiving a sample of a respective medium to be examined; and at least one thermometer means at least partly embedded in a recess means on an outer side of said wall means, said thermometer means being provided in and separated from said cavity by said wall means.

4,218,142

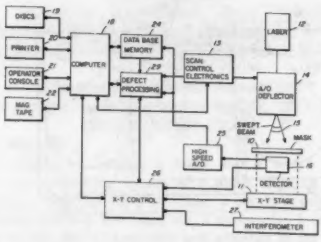
MASK ANALYSIS

David L. Kryger, Chelmsford, and R. William Killam, Tewksbury, both of Mass., assignors to Aerodyne Research, Inc., Bedford, Mass.

Filed Mar. 8, 1978, Ser. No. 884,606

Int. Cl.² G01N *21/32*

U.S. Cl. 356—394 **9 Claims**



9. A method of analyzing integrated circuit production masks, each of said masks comprising a multiplicity of substantially identical dies arranged in columns and rows to detect minute inconsistencies in said dies, said dies corresponding to portions of electrical circuits and consisting of optically transparent and opaque areas corresponding to said portions of electrical circuits, said method comprising scanning each of said dies with a laser beam focused in a spot approximately the size of inconsistencies to be detected to determine a position

pattern corresponding to said pattern of transparent and opaque areas for each of said dies, selecting a pattern corresponding to one of said dies and comparing said selected pattern against the patterns corresponding to each of the others of said dies, and observing differences between said patterns to determine the existence of inconsistencies between one pattern and another, whereby to detect flaws in said patterns of transparent and opaque areas of said dies.

4,218,143

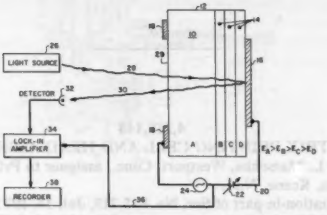
LATTICE MATCHING MEASUREMENT DEVICE

Nicholas Bottka, Caracas, Venezuela, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1979, Ser. No. 5,256

Int. Cl.[3] G01N *21/55*; H01L *27/14*

U.S. Cl. 356—445 **20 Claims**



1. An apparatus for measuring lattice match between layers of a multi-layer semiconductor epitaxially grown on a substrate comprising:

a tunable source of monochromatic light for illuminating said semiconductor from the substrate side such that said light is transmitted through said semiconductor;

an electrode in electrical contact with the bottom surface of said substrate for applying a voltage across said semiconductor;

a Schottky barrier contact on the top surface of the uppermost layer of said multilayer semiconductor for applying voltage across said semiconductor, said Schottky barrier contact of sufficient area to reflect light transmitted into said semiconductor through said substrate;

a variable voltage source connected to said electrode and said Schottky barrier contact for varying the voltage in a predetermined manner across said semiconductor;

a detector with an output, said detector positioned to receive said incident monochromatic light after it is reflected from said semiconductor for measuring said reflected light;

means for amplifying said detector output to a predetermined level connected to said detector output; and

means for recording said amplified detector output as a function of said varied voltage connected to said amplification means.

4,218,144

MEASURING INSTRUMENTS

David J. Whitehouse, Melton Mowbray, and John Jungles, Thurmaston, both of England, assignors to The Rank Organisation Limited, London, England

Filed Sep. 8, 1978, Ser. No. 940,665

Claims priority, application United Kingdom, Sep. 9, 1977, 37709/77

Int. Cl.[2] G01N *21/48*

U.S. Cl. 356—446 **10 Claims**

1. In an optical sensing instrument for inspecting surfaces by detecting reflection therefrom at various different angles of incidence and reflection,

a sensing head;

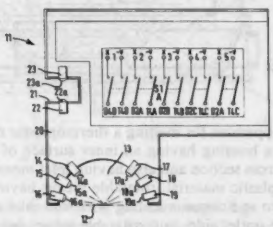
means defining a plane in which a surface under test lies in use of said instrument;

a plurality of light sources carried on said sensing head;

a plurality of first lenses each associated with a respective one of said light sources, said first lenses directing light from their respective associated sources along respective optical axes towards a common area on said plane;

a plurality of photodetectors mounted on said sensing head;

a plurality of second lenses each associated with a respective one of said photodetectors for directing light reflected



from a surface located at said plane to respective associated said photodetectors, the optical axis of each said first lens passing through said common area and lying at an angle, with respect to a normal to said plane, which is equal and opposite to the angle with respect to said normal formed by the axis of a respective one of said second lenses; and

means for selecting which of said light sources and which of said photodetectors is to be energised at any one time during operation of said instrument.

4,218,145

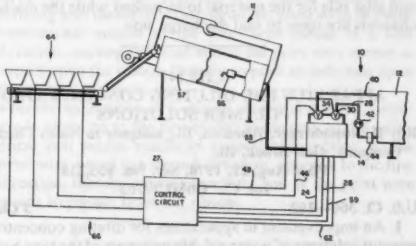
LIQUID ASPHALT WEIGH OUT SYSTEM

James D. Brock, and Erbie G. Mize, both of Chattanooga, Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Mar. 14, 1979, Ser. No. 20,266

Int. Cl.[3] B28C *7/04*

U.S. Cl. 366—18 **19 Claims**



1. Apparatus for metering-out liquid asphalt, said apparatus comprising:

a plurality of tanks for containing a quantity of liquid asphalt;

a load cell for each tank;

means for applying the weight of each of said tanks and contents thereof to said tank's load cell;

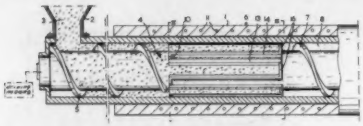
means for filling each tank with liquid asphalt; and

means, responsive to said load cells, for selectively removing liquid asphalt from said tanks at a desired rate by weight.

4,218,146
APPARATUS FOR MELTING A THERMOPLASTIC MATERIAL

Jan F. Ingen Housz, Drienerbrakenweg 12, Enschede, Netherlands

Filed Feb. 27, 1978, Ser. No. 881,504
Claims priority, application Netherlands, Feb. 25, 1977, 7702020
Int. Cl.³ B29B *1/06*
U.S. Cl. 366—78 **10 Claims**



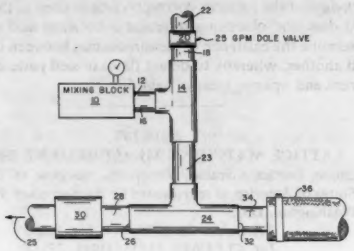
1. An apparatus for melting a thermoplastic material, which includes: a housing having an inner surface of a substantially circular cross section and also having inlet means for receiving a thermoplastic material, rotatable means having an inlet side adjacent to and communicating with said inlet means and also having an outlet side, said rotatable means being rotatable in said housing and defining therewith a heating space, means for conveying a substantially solid, particulate or granulate thermoplastic material into said heating space, said heating space being located between said inlet and said outlet side, said housing comprising heating means surrounding said heating space for melting thermoplastic material received therein, said rotatable means comprising at least three pairs of alternating first and second ridges, having a width at the top which is relatively small, said ridges being fixedly connected to said rotatable body and located within the region of said heating space, said ridges following a screw path having a pitch angle within the range of from 45° to 90° inclusive, while each two adjacent first and second ridges form with each other relatively wide inlet channels and relatively narrow discharge channels, said inlet channels having a width larger than twice the width of said discharge channels, said first ridges extending along the inside surface of said housing and close thereto, said second ridges respectively being arranged between said first ridges and extending substantially parallel to said first ridges, said second ridges extending along said inner surface of said housing with such a clearance relative to said inner surface as to substantially prevent the passage of non-molten material through the space defined by said clearance, and transverse wall means interconnecting the ends of adjacent first and second ridges respectively so that said inlet channels are open to said inlet side for the material to be melted while the discharge channels are open to said discharge side.

4,218,147
APPARATUS FOR DILUTING CONCENTRATED POLYMER SOLUTIONS

Roy R. Rosenberger, Wheaton, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 21, 1978, Ser. No. 935,218
Int. Cl.² G05D *11/02*
U.S. Cl. 366—162 **3 Claims**

1. An improvement in apparatuses for diluting concentrated aqueous solutions of water-soluble polymers of the type having an inlet and an outlet, and a mixing zone therebetween, the improvement which comprises a substantially vertical line fitted to the outlet with the vertical line containing a first flow control means, T means and a leg, said T means being positioned between said first flow control means and said leg and being connected to said outlet, a discharge line for feeding dilute water-soluble polymer solution, means connecting said discharge line to the bottom of the leg, said discharge line being substantially perpendicular to said vertical line, said discharge line being fitted with a second flow control means and means for supplying water to the vertical line and the discharge line, with the first flow control means being upstream of the T means and the second flow control means

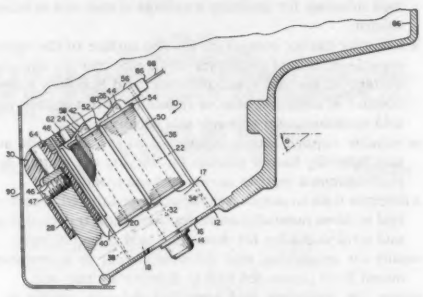


being between the means for supplying the water to the discharge line and the vertical line.

4,218,148
MATRIX PRINTING CELL AND HEAD ASSEMBLY

Arthur L. Matschke, Westport, Conn., assignor to Printer Associates, Keene, N.H.

Continuation-in-part of Ser. No. 815,718, Jul. 14, 1977, Pat. No. 4,134,691, which is a continuation of Ser. No. 646,626, Jan. 5, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,955
The portion of the term of this patent subsequent to Jan. 16, 1996, has been disclaimed.
Int. Cl.² B41J *3/12*
U.S. Cl. 400—124 **22 Claims**



18. In an electromagnet assembly for driving a print wire in a dot matrix print head, the improvements comprising:

magnetizable armature means secured to said print wire and driving said print wire upon energization of said electromagnet assembly;

two pole faces on said armature means at an angle of 16° to 20° to the axis thereof;

magnetizable core means including a pair of coils and a pair of core pole faces sloped similarly to said armature pole faces and defining therebetween two closeable air gaps;

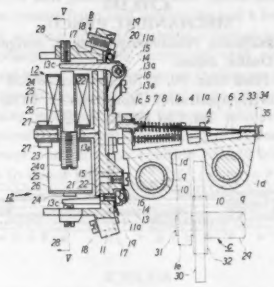
columnar spring means securing said armature means to said core means near the ends of said armature means; and

slightly resilient preset means secured to said core means and adapted to engage the rear end of said armature means in the rest position and including a slot surrounding but not touching the adjacent one of said spring means in all but the operational direction, when in the rest position.

4,218,149
WIRE PRINTER

Mutsumi Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Kyobashi, Japan

Filed Apr. 21, 1978, Ser. No. 898,771
Claims priority, application Japan, Apr. 22, 1977, 52/46386
Int. Cl.[2] B41J 3/12
U.S. Cl. 400—124 2 Claims



1. A wire printer comprising:

a base frame over which paper to be printed on advances in use;

a carriage movable over said base frame in a direction transverse to the direction of advance of the paper to be printed on, said carriage including a plurality of guide members equispaced along the direction of movement of said carriage;

a plurality of print wires each having a respective front and rear end, mounting means on said carriage slidably mounting the front and rear ends of said print wires on said carriage with the respective front ends of said print wires equispaced along the direction of movement of said carriage opposite the paper to be printed on, and said plurality of guide members of said carriage being positioned each for slidably supporting and maintaining a portion of a respective print wire intermediate its front and rear ends straight, wherein the number of print wires is equal to a submultiple of a total number of characters to be printed in a line of printing;

a plurality of stationary electromagnet devices on said base frame each for driving a print wire independently of the other electromagnet devices, each electromagnet device comprising a magnetic core having a coil wound thereon and magnetized in response to current flowing through said coil, a print lever displaced by the magnetized core and having a striking portion for striking the rear end of a corresponding print wire when it is displaced at any position to which said carriage moves; and

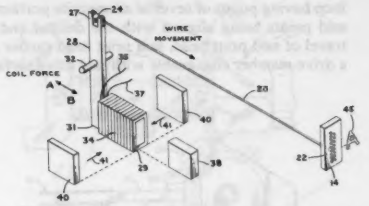
means for reciprocating said carriage in the direction transverse to the direction of advance of the paper to be printed on for a distance approximately corresponding to a space between front ends of adjacent print wires;

whereby energization of selected ones of the stationary electromagnet devices as said carriage is reciprocating in the direction transverse to the direction of advance of the paper to be printed on is effective for printing selected characters in use on the paper.

4,218,150
MATRIX PRINTER

Ronald L. Swaim, Sunnyvale, Calif., assignor to Vydec, Inc., Florham Park, N.J.

Filed Nov. 20, 1978, Ser. No. 962,095
Int. Cl.[3] B41J 3/12
U.S. Cl. 400—124 5 Claims



1. An apparatus for printing indicia comprising:

a. print wire means having a front end and a rear end, the print wire means for printing indicia upon a printing medium by impact of the front end of the print wire means upon a ribbon positioned between the front end of the print wire means and the printing medium;

b. pivoting arm means having a central end, a pivot, and a peripheral end, the central end of the pivoting arm means secured to the rear end of the print wire means, the pivoting arm means for producing translational motion of the print wire means;

c. cylindrical coil means, secured to the peripheral end of the pivoting arm means, the cylindrical coil means for applying an electromagnetic force to the peripheral end of the pivoting arm means, thereby to produce rotational motion, about the pivot, of the pivoting arm means and thus translational motion of the print wire means, the electromagnetic force applied by the cylindrical coil means to the peripheral end of the pivoting arm means related to electrical current in the cylindrical coil means and also related to an external magnetic field applied to the cylindrical coil means;

d. means for applying the external magnetic field to the cylindrical coil means;

e. whereby application of a first electrical current to the cylindrical coil means results in a first electromagnetic force applied to the pivoting arm means, causing the pivoting arm means to rotate about the pivot so as to cause translational motion of the print wire means in a first direction, causing the front end of the print wire means to impact upon the ribbon, thereby to print an indicium upon the printing medium; and,

f. whereby application of a second electrical current, opposite in direction to the first electrical current, to the cylindrical coil means results in translational motion of the print wire means in a second direction, opposite to the first direction, thereby causing the front end of the print wire means to retract from the ribbon.

4,218,151
SERIAL IMPACT CALCULATOR PRINTER

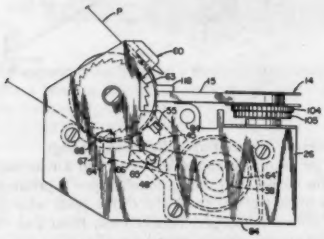
Nicholas Kondur, Jr., Riverton, Wyo., assignor to LRC, Inc., Riverton, Wyo.

Continuation of Ser. No. 732,474, Oct. 14, 1976, abandoned, which is a division of Ser. No. 527,603, Nov. 27, 1974, Pat. No. 3,986,594. This application Mar. 24, 1978, Ser. No. 889,918
Int. Cl.[2] B41J 19/70, 19/56, 19/94
U.S. Cl. 400—314.1 6 Claims

1. In a printing apparatus having a frame and a print head carrier including a print head selectively actuated by actuating means associated with said head to impress characters on a recoridng medium, a pair of recording medium advance rollers

mounted for rotation on spaced parallel axes with the external roller surfaces engageable with one another to define a common guide path for advancement of the recording medium therebetween, the improvement comprising:

rotatable print head drive means engageable with said print head carrier to reversibly drive said print head in a print and return direction transversely of the direction of advancement of the recording medium, said drive means including drive surface means in the form of a continuous loop having points of reversal at opposite portions thereof, said points being aligned with the desired end limits of travel of said print head, said print head carrier including a drive member engageable with said drive surface means



to impart linear reversible movement to said print head when said continuous loop is advanced;

incremental advancing means including an eccentric member mounted for rotation with said print head drive means and a follower arm constrained for movement along the surface of said eccentric member, said follower arm responsive to movement of said eccentric member when said print head drive means and said drive member are advanced in a return direction to incrementally drive one of said recording medium advance rollers in a direction causing incremental advancement of the recording medium; and

motor drive means for driving said continuous loop to impart linear mvement to said print head.

4,218,152

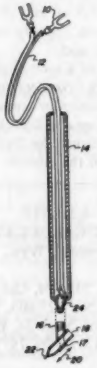
ELECTRIC RESIST WAX PEN

Leila C. Sloan, 212 Weiders La., Emmaus, Pa. 18049

Filed Dec. 28, 1978, Ser. No. 974,219

Int. Cl.[3] A46B *11/08*

U.S. Cl. 401—2 **4 Claims**



1. Apparatus for controlling the rate of flow of molten material from the tip of an electric resist pen to a work piece comprising:

(a) a font for containing flowable material;

(b) a capillary tip passing through said font to its interior whereby material in said font may flow to said work piece; and

(c) heat conducting font holding means including coupling means for connecting said font holder at one end to a resistance heat source and transverse font grasping means at said other end, said font grasping means slidably engaging said font whereby, by adjusting variable font resting positions, the amount and placement of heat transferred from holder to font is controlled, thereby controlling said flow rate of molten material from said pen.

4,218,153

MECHANICAL PENCIL

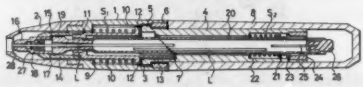
Yasuyuki Hashimoto, Nishinomiya, Japan, assignor to Ancos Co., Ltd., Osaka, Japan

Filed Mar. 30, 1979, Ser. No. 25,525

Claims priority, application Japan, Apr. 1, 1978, 53-37457

Int. Cl.[2] B43K *21/22*

U.S. Cl. 401—67 **8 Claims**



1. A mechanical pencil comprising:

a main hollow body comprising a first body member and a second body member, said second body member having a mouth opening at an end thereof, said first body member being rotatable with respect to said second body member and said first and second body members engaging each other,

a slider retractable in said mouth opening, said slider having a lead retainer for frictionally gripping lead and an opening through which lead protrudes,

a lead case for storage of extra leads therein,

biasing means for biasing said lead case for movement in one direction,

a lead gripping chuck connected at one end of said lead case,

means for receiving and tightening said chuck and for advancing the chuck with said means to supply a new lead having a predetermined length from the opening of the slider, and

means for converting the rotational movement of said first body member to reciprocating movement of means for said tightening said chuck,

whereby a new lead is supplied from the opening of the slider by rotation of the first body member.

4,218,154

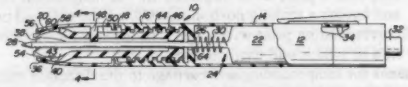
WRITING INSTRUMENT WITH SELF-CLOSURE

David Erfer, 412 Yale Ave., Broomall, Pa. 19008

Filed Jun. 26, 1978, Ser. No. 918,714

Int. Cl.[2] B43K *24/00*

U.S. Cl. 401—107 **9 Claims**



1. A writing instrument having a barrel, a writing tip disposed in said barrel, a retracting mechanism for said writing tip, and a self-closure operatively associated with said barrel and said writing tip; said closure comprising a plurality of resilient segment members having tapered lower end portions, said lower end portions being complemental with each other

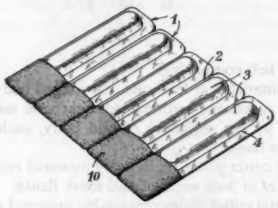
when said segment members are operatively disposed so as to define a hollow protective enclosure for said writing tip, and closure-actuating means interconnecting said barrel and said segment members for moving said segment members in relation to said barrel between a first position in which said segment members are operatively disposed and another position in which said segment members are retracted so as to permit exposure of said writing tip, said closure-actuating means comprising screw thread portions disposed in said barrel, screw thread portions on said segment members complemental with said first-mentioned screw thread portions, means interconnecting said barrel and said segment members for rotating said segment members with respect to said first-mentioned screw thread portions, whereby said segment members may be moved between said positions and said barrel comprising an upper portion remote from said writing tip and a lower portion adjacent said writing tip and rotatably coupled to said upper portion in coaxial alignment therewith, said screw thread portions in said barrel being disposed in said upper portion, and said means interconnecting said barrel and said segment members comprising interlock means between said lower portion and said segment members so that said segment members rotate with said lower portion upon rotation of said lower portion with respect to upper portion.

4,218,155

STICK FOR APPLYING A LIQUID

Richard K. Weidner, Remelfing, France, assignor to Etablissements Armor, S.A., Paris, France

Filed Feb. 10, 1978, Ser. No. 876,941
Int. Cl.² A47L *13/17*
U.S. Cl. 401—132 **2 Claims**



1. A package which is manually separable into a plurality of individual cleaning sticks for application of a volatile cleaning liquid to a surface to be cleaned comprising:

a first thermoplastic sheet having a plurality of spaced parallel elongated troughs formed therein, filled with volatile cleaning liquid, each trough including at one end a reduced cross section dispensing portion;

a second sheet of thermoplastic material overlying said first sheet on the open side of said troughs and heat sealed thereto to define a plurality of closed liquid filled containers;

a plurality of cut out portions extending inwardly from one end of said sheets to form openings between each pair of reduced dispensing portions of said troughs, the edges of said cut out portions having protrusions thereon;

means defining a rupture score line across each of said dispensing portions;

a plurality of open celled foam plastic applicator members one enclosing each dispensing portion respectively, engaging with said protrusions and welded to said dispensing portions; and

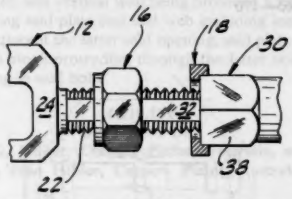
means defining a score line between each adjacent trough to facilitate separation into individual cleaning sticks.

4,218,156

VARIABLE LENGTH LINKAGE

Scott R. Logan, Danvers, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 27, 1979, Ser. No. 34,062
Int. Cl.² F16B *39/00*
U.S. Cl. 403—320 **3 Claims**



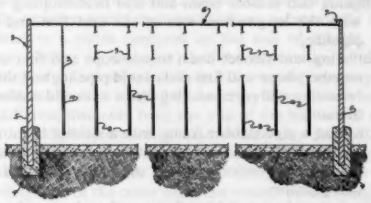
1. An adjustable lever arm having an externally threaded rod threadably connected at one end to an internally threaded rod, each rod having a rod end spherical bearing connector at its opposite end, lever arm adjustment means including an enlarged knob on the end of the internally threaded rod end which is regular polygonal in cross-section, said knob having an even number of flat surfaces about the periphery thereof so that the rod can be rotated thereby, the number of flat surfaces determining the degree of rotation of said knob and thereby the length of the lever arm, locking means including flattened opposite sides of the externally threaded rod, a locknut having a friction insert and a keeper slideable on the flattened sides, said keeper comprising a plate with a pair of flanges along opposite side edges thereof and an elongated slot with its principal axis normal to said flanges, said flanges being spaced apart such that they pass over opposing flat surfaces of the knob and such that the keeper is restrained thereby from rotation with respect to said knob, said elongated slot being flat along opposite side edges thereof, said side edges being spaced so that the flat sides of the slot pass over the flattened sides of the threaded rod and so that the keeper, while slideable on the flattened sides, is restrained thereby from rotation with respect to said threaded rod, and can be locked in place by said locknut.

4,218,157

PARKING LOT MARKER APPARATUS

Kermit W. Moxness, 909 SW. Kenyon, Des Moines, Iowa 50315

Filed Aug. 21, 1978, Ser. No. 935,452
Int. Cl.² E01F *13/00*
U.S. Cl. 404—6 **8 Claims**



1. A parking space indicator and guide comprising:

at least two upright support members, a horizontal support to said upright support members, a plurality of means for providing parking space markers suspended from said horizontal support member, wherein;

said plurality of means for providing parking space markers

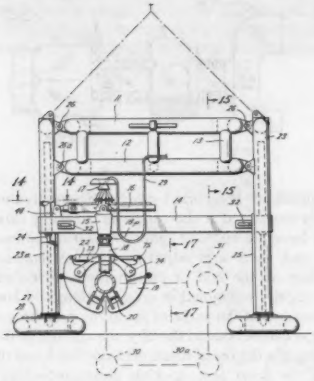
are spaced one from the other a distance greater than the width of any car, and said distance coincides with standard width parking lane indicia.

4,218,158

PIPE HANDLING METHOD AND APPARATUS

Prosper A. Tesson, 11942 Summerdale, Houston, Tex. 77079

Filed Oct. 14, 1977, Ser. No. 842,237
Int. Cl.[2] B23P *19/04*; F16L *1/00*
U.S. Cl. 405—170 **18 Claims**



1. The method of repairing a damaged pipeline on the ocean floor comprising the steps of:

lowering a first mobile pipe handling frame having a hydraulic pipe clamp thereon into a position over said pipeline and spaced from one side of said damaged portion;

lowering a second mobile pipe handling frame having a hydraulic pipe clamp thereon into position over said pipeline and spaced from the other side of said damaged portion;

engaging said hydraulic pipe clamps on said first and second frames about said pipeline on either side of said damaged portion;

raising said pipe clamps on said first and second pipe handling frames to thereby raise the damaged portion of said pipeline into a working position above the ocean floor;

removing the damaged portion of said pipeline to thereby leave first and second ends of said pipeline spaced laterally from each other and supported by said first and second pipe handling frames;

lowering a pipe stabber frame having a stabber beam thereon and a first tubular coupling member releasably attached thereto into the space between the first and second ends of said pipeline;

aligning said stabber beam and said first coupling member with the longitudinal axis of the said first end of said pipeline;

actuating said stabber beam to telescope said first coupling member about said first end of said pipeline and thereafter removing said pipe handling frame with said stabber beam thereon;

lowering a pipe stabber frame with a stabber beam thereon and a second tubular coupling member releasably attached thereto into position between said first and second ends of said pipeline;

aligning said pipe stabber beam and said second coupling member with the longitudinal axis of said second end of said pipeline;

actuating said stabber beam to telescope said second coupling member about said second end of said pipeline, and thereafter removing said pipe handling frame with said stabber beam thereon;

lowering into position between said first and second ends of said pipeline, a third pipe handling frame having a hydraulic clamp thereon with a tubular connector adapted to engage said first and second coupling members releasably carried by said pipe clamp;

aligning the longitudinal axis of said tubular connector with the longitudinal axes of said first and second ends of said pipeline and said first and second tubular coupling members;

sealably engaging one end of said tubular connector with said first tubular coupling member and the other end of said connector with said second tubular coupling member; and

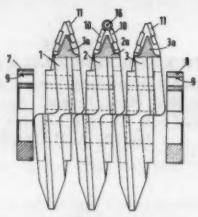
releasing said hydraulic pipe clamps on said pipe handling frame and removing said pipe handling frames from said ocean floor.

4,218,159

MULTIPLE-PART HOBBING CUTTER

Hans Langen, Düsseldorf, Fed. Rep. of Germany, assignor to Sack GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 867,334, Jan. 6, 1978, abandoned. This application Apr. 10, 1979, Ser. No. 28,734
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700525; Nov. 4, 1977, 2749372; Nov. 30, 1977, 2753286
Int. Cl.[3] B26D *1/12*
U.S. Cl. 407—25 **14 Claims**



1. A gear hob comprising:

a body comprising at least one disc-shaped body segment;

a helix of successive teeth extending around said body and formed by the periphery of said body, each said tooth having a flank;

first metal cutter plates replaceably mounted respectively at the top of at least some of said tooth flanks;

second metal cutter plates replaceably mounted at the top of respective opposing tooth flanks, said first and second cutter plates alternating along the helix at opposite sides of at least some of the adjacent teeth and having at least partially overlapping cutting paths; and

at least one said tooth serving to cut on the normal to the cutter axis which extends through the center of the gear wheel and being provided in the region of the apex of said at least one tooth with a further hard-metal reversible plate having an arc-shaped cutting edge for rounding-off the tooth space, the radius of said arc-shaped cutting edge being determined by the desired rounding-off in the tooth base.

4,218,160

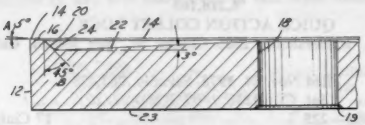
HEAVY DUTY CUTTING INSERT

Leonard R. Arnold, Highland Park, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Filed Sep. 15, 1978, Ser. No. 942,551
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—114 **4 Claims**

1. An indexable throwaway insert formed of hard material for heavy duty cutting comprising a polygonal body having conjunctive sides lying in planes parallel to the axis of the body

and defined by upper and lower peripheral edges lying in parallel planes perpendicular to said axis, each upper peripheral edge forming the outer boundary at a sharp junction of a narrow land extending inwardly and downwardly from the edge at a relatively low angle, a secondary surface extending around the periphery of said body joining conjunctively with the inner edge of said land and dropping sharply downward



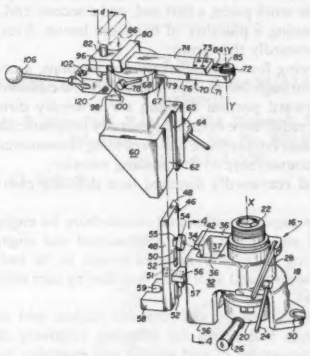
from said land at an angle of 30° to 55° and a central surface within said secondary surface in the form of a low angle, flat-sided pyramid rising from each side of the polygonal body substantially to but below the level of the plane of said edges at the center of the body, said central surface rising from the lowest point of the secondary surface in the direction of the center of the insert at an angle ranging from 1° to 5°.

4,218,161

ARRANGEMENT FOR COUPLING A DRILL JIG TO AN INDEXING APPARATUS

Jack I. Zolkind, 1514 Eric La., East Meadow, N.Y. 11554

Filed Jan. 5, 1978, Ser. No. 867,013
Int. Cl.³ B23B *49/02*; B23Q *21/00*
U.S. Cl. 408—89 **4 Claims**



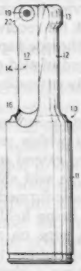
1. Apparatus for facilitating the drilling of holes in a workpiece by a drill press, said drill press including a drill defining a drill axis, said apparatus comprising a fixture securable to said drill press for holding a workpiece in alignment with the axis of the drill, a drill jig for positioning the drill relative to said workpiece comprising a support body, coupling means for adjustably mounting said body on said fixture in one of a selected plurality of positions along a line parallel to the axis of the drill, a drill bushing having an axis, an arm adapted to carry said drill bushing and movably mounted in said body to be adjustable along a plane perpendicular to the axis of the drill and to adjust the axis of the bushing relative the workpiece, said body being provided with a dovetail groove and said coupling means for mounting said body on the fixture comprising a plate coupled to said drill press and fixedly securable to said fixture and having beveled edges conforming to said dovetail groove, said plate being accommodated in said groove, said groove and plate having a longitudinal axis parallel to the axis of the drill, and means for locking said plate in said groove to said plate at selected positions therealong, said fixture including a turret, a housing for said turret, a collet for holding the workpiece mounted in said turret, said turret being rotatable about a vertical axis parallel to the axis of the drill, and a web on said housing including a vertical wall relative to which said turret is rotatable, said vertical wall and plate having cooperating slot and detent means for interlocking the same which consists of said vertical wall being provided with a vertically aligned slot and including a spline and said plate including detent means for fitting in said slot and an elongated opening for receiving said spline for further interlocking said vertical wall and plate, said vertical wall being provided with a further opening facing said plate and said web including means defining a hole adjacent the latter said opening, said plate including an L-shaped block protruding through the latter said opening and engaging in said hole.

4,218,162

DRILLING BIT

Raymond G. Hillier, Coopers Plains, Australia, assignor to Elizabeth Jean Hillier, Coopers Plains, Australia; a part interest

Filed Nov. 1, 1978, Ser. No. 956,822
Int. Cl.³ B23B *51/00*; B23C *5/20*
U.S. Cl. 408—188 **1 Claim**



1. A drilling bit of the type comprising a plurality of cutters each having cutting edges into a plane substantially radial to the axis of the bit, wherein,

said drilling bit includes a reduced diameter shank and an outer head of greater diameter than said shank, said cutters being mounted in said outer head, said shank portion of said bit being formed with two opposed longitudinal flutes adjacent the outer end of which said cutters are mounted, the faces of said flutes being perpendicular to each other and in planes radial to the axis of said bit;

each of said cutters is of substantially frusto-conical shape and rotatable about its axis to expose a fresh cutting segment,

means are provided for releasably locking each of the cutters against rotation about its axis,

each cutting edge consists of a segmental part of a substantially circular cutter each with its axis substantially tangential to a circle centered on the axis of the bit, the cutters being so arranged that the extremities of their cutting edges are substantially in a diametral plane perpendicular to the axis of the bit, the axes of the cutters being at different distances from the axis of the bit, one of said cutting edges intersecting, near to one side thereof, the axis of the bit, two cutters being mounted in the leading face of one flute, and one cutter being mounted in the leading face of the outer flute, the cutters intersecting the axis of said bit having its face in a plane passing through said axis, and the outer cutters having leading faces which are somewhat inclined to the plane of said cutter intersecting the bit axis,

the diameter of one of said cutters is slightly larger than the diameter of the other two cutters, with said one cutter being spaced from the axis of the bit a distance approximately midway between the distances of the axes of the other cutters from the bit axis, and

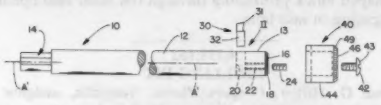
concentric arcuate projections are formed on the end of said drilling bit which back the projecting segmental cutting edges of the cutters.

4,218,163

ROTARY CUTTING TOOL WITH OFFSET CUTTING ELEMENT

William O. Druschel, Raemont Rd., Granite Springs, N.Y. 10527

Filed May 17, 1978, Ser. No. 906,771
Int. Cl.[2] B23B *27/00*
U.S. Cl. 408—196 12 Claims



1. A rotary cutting tool comprising:

a rod-shaped shank having one end for attachment to a chuck and an opposite end, said shank including a transversely extending aperture spaced inwardly from said opposite end and having its axis offset from the longitudinal axis of said shank for receiving a cutting element and an axially extending threaded aperture extending inwardly from said opposite end of said shank into communication with said transversely extending aperture for receiving a set screw; and

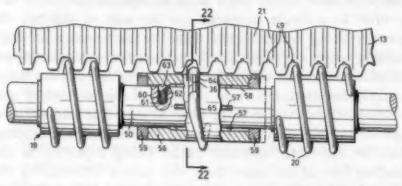
a cutting element having a cutting edge and having a cross section shaped to fit within said transversely extending offset aperture and to extend outwardly from said shank and adjustably held in said shank by said set screw to adjust the size of a hole formed by said cutting tool with said cutting element being held in said offset aperture to position said cutting edge on a true diameter of a hole being formed by said cutting tool, said transversely extending aperture having a plurality of walls to define a keyed aperture for indexing said cutting element in said keyed aperture, and said opposite end of said shank being knurled at its junction with the cylindrical sidewall of said shank.

4,218,164

APPARATUS AND METHOD FOR PERFORATING TUBING

Gerd P. H. Lupke, 46 Stornoway Crescent, and Manfred A. A. Lupke, 35 Ironshield Crescent, both of, Thornhill, Ontario, Canada

Continuation-in-part of Ser. No. 881,417, Feb. 27, 1978, Pat. No. 4,180,357. This application Jan. 11, 1979, Ser. No. 2,757
Claims priority, application Canada, Mar. 18, 1977, 274316
Int. Cl.[2] B26D *3/16;* B29C *17/10*
U.S. Cl. 409—131 22 Claims



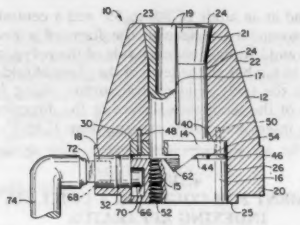
17. A method of perforating tubing, the method comprising the steps of advancing the tubing along an axial path thereof, and simultaneously rotating at least one cutter in a rotary path which is in a plane substantially at right angles to said axial path of the tubing and which intersects the tubing thereby to perforate the tubing by intermittent intersection of the tubing by the cutter, while the cutter is being moved by the tubing in a direction parallel to said axial path from a rearward position to a forward position thereof, and returning the cutter from the forward position to the rearward position between operative intersections of the tubing by the cutter, the tubing being supported and being restrained against rotation thereof about said axial path during intersection of the tubing by the cutter.

4,218,165

QUICK ACTION COLLET LOCK

Viggo M. Riddersholm, 2355 Clipper St., San Mateo, Calif. 94403

Filed Nov. 24, 1978, Ser. No. 963,478
Int. Cl.[2] B23C *1/00;* B23D *31/20*
U.S. Cl. 409—225 17 Claims



1. An apparatus for holding a work piece to be machined comprising:

a generally tubular shaped collet having an inner surface for gripping the work piece, a first end, and a second end, said first end having a plurality of bendable leaves diverging radially outwardly therefrom;

a housing having forward and rearward portions, a central bore therethrough for receipt of the collet, a counterbore in the rearward portion defining a rearwardly directed face, and a radial bore oriented generally perpendicular to the axis of said counterbore and providing communication from said counterbore to the housing exterior;

means on said rearwardly directed face defining cam surfaces;

means loosely disposed within said counterbore for engaging the second end of the collet, said second end engaging means having a radially directed recess in its radially outermost surface and a forward face having cam surfaces thereon; and

means insertable through, and rotatable within, said radial bore and into said recess for effecting relatively slight rotational movement of said second end engaging means generally about the axis of said counterbore, said recess having a wall oriented generally parallel to the axis of said central bore, said rotational movement means having an eccentric shaft protruding into said recess, whereby during movement of said eccentric shaft, said shaft contacts said wall and rotationally biases said second end engaging means so that the cam surfaces thereon ride up on the cam surfaces on said rearwardly directed face and said second end engaging means and therewith the collet is displaced rearward to hold the work piece.

4,218,166

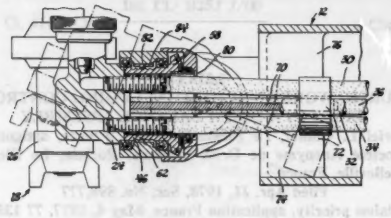
GUIDE DEVICE FOR MULTI-AXIS MANIPULATOR

Abdulhadi K. Abu-Akeel, Sterling Heights; Thomas Barrowman, Warren, and Gerald C. Rieck, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1978, Ser. No. 963,430
Int. Cl.[2] B25J *19/00*
U.S. Cl. 414—1 2 Claims

1. In combination with a multi-axis manipulator having an elongated arm terminating with a wrist assembly that includes a gear unit for pivoting a carrier about a first axis and for

rotating an output shaft about a second axis which is perpendicular to said first axis, a work tool connected to said output shaft, a plurality of flexible supply lines located within said arm and connected at one end to said work tool, the improvement wherein guide means are provided within said arm for supporting a portion of said supply lines and minimizing the strain on said supply lines when said work tool is moved about said first or second axis, said guide means including a block member mounted in said arm rearwardly of said wrist assembly for



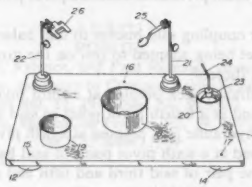
supporting the supply lines for limited rotative and sliding movement relative to said arm, a flexible motion transmitting means connected at one end to said work tool and connected at the other end to said block member so as to cause corresponding rotational movement of said block member when said work tool is rotated by the output shaft about said second axis and to cause sliding movement of said block member when said carrier is pivoted about said first axis so that bending stresses in the supply line are minimized.

4,218,167

FEEDING APPARATUS FOR A MANUALLY DISABLED PERSON

Henry T. Mansfield, P.O. Box 434, Barnwell, S.C. 29812

Filed Sep. 5, 1978, Ser. No. 939,499
Int. Cl.³ A61J *7/00*
U.S. Cl. 414—9 **42 Claims**



1. A feeding apparatus for a manually disabled person to eat food comprising:

(a) an eating surface;

(b) a mouth-held implement means independent of said eating surface, held in the mouth of said manually disabled person, and operative to place said food on said eating surface;

(c) a mouthpiece operative to be placed in said mouth of said manually disabled person;

(d) a chin rest secured to said mouthpiece and operative to press against the face of said manually disabled person whereby the amount of pressure on said chin rest is applied by said mouth to control said mouth-held implement means; and

(e) an implement means secured to said chin rest and operative to hold said food;

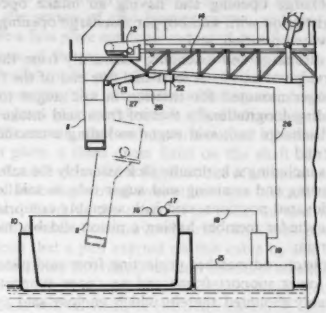
whereby said manually disabled person may eat a meal placed before said person without assistance.

4,218,168

METHOD OF AND APPARATUS FOR LOADING A FLOATING VESSEL WITH FLOWABLE SOLIDS

Ward H. Parsons, 1202 Green Glen Rd., Birmingham, Ala. 35216

Filed Aug. 14, 1978, Ser. No. 933,502
Int. Cl.³ B65G *67/62*
U.S. Cl. 414—139 **3 Claims**



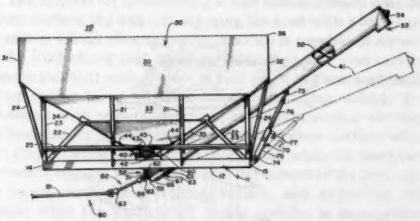
1. A method of loading a floating vessel with flowable solid material comprising the steps of electrically sensing a port-starboard list of a vessel undergoing loading with flowable solid material by operation of an onboard electrical list sensor and thereby producing an electrical signal which is proportional to the degree of list of the vessel at a given instant, instantly utilizing said electrical signal to operate an automatically responsive on-shore flowable solid material delivery device in a back-and-forth port-to-starboard direction to continually correct the listing of the vessel and return it and the onboard electrical list sensor to a null position by delivering said material to the high side of the vessel away from the list, and continuing the above steps of the method until the floating vessel is fully loaded with the flowable solid material.

4,218,169

PORTABLE, SELF-UNLOADING FERTILIZER TENDER

Kenneth W. Arends, Willmar, Minn., assignor to Waycrosse, Inc., Minnetonka, Minn.

Filed Mar. 28, 1978, Ser. No. 890,999
Int. Cl.³ B60P *1/40*
U.S. Cl. 414—523 **2 Claims**



1. A portable, self-unloading fertilizer tender suitable for mounting on a truck or trailer for road or ground travel, which comprises:

a. a longitudinally extending frame having front and rear ends;

b. a hopper mounted upon said frame, said hopper having

(1) a discharge opening at the bottom thereof at a location spaced longitudinally from at least one end of the frame, and

(2) front and rear end walls, one of said end walls sloping

downwardly and inwardly from said one end of the frame toward said discharge opening;

c. a longitudinally extending auger tube having

(1) an intake end pivotally mounted adjacent said one end wall for vertical swinging movement of said tube between a lowered and an elevated position, said tube rotating beneath said one end wall about a transverse, horizontal pivot axis adjacent said discharge opening with said intake end positioned adjacent said hopper discharge opening and having an intake opening in registration with said hopper discharge opening in said elevated position, and

(2) a discharge end extending outwardly from the transverse pivot axis to at least said one end of the frame;

d. an auger mounted for rotation in said auger tube and extending longitudinally thereof from said intake end to said discharge end, said auger including a coaxial auger shaft; and

e. means including a hydraulic jack assembly for selectively supporting and retaining said auger tube in said lowered and elevated positions, said jack assembly comprising

(1) a cylinder member having a piston slidably mounted therein;

(2) a piston rod member projecting from said piston;

(3) a lower support frame and an upper support frame slidably mounted therein which enclose said cylinder member and piston rod member, each of said support frames having one or more holes drilled therein, said lower support frame being pivotally connected to said one end of the frame and said upper support frame being pivotally connected to said auger tube,

(4) a spring-loaded stop pin mounted on said lower support frame so that when a hole in said upper support frame and a hole in said lower support frame are aligned, said stop pin will be forced through both of said holes; and

(5) the pivotal connections of the lower and upper support frames effectively pivotally mounting the lower end of the cylinder member at said one end of the longitudinally extending frame and pivotally connecting the piston rod member to said auger tube.

4,218,170

FRONT AND SIDE LOADING INDUSTRIAL LIFT TRUCK

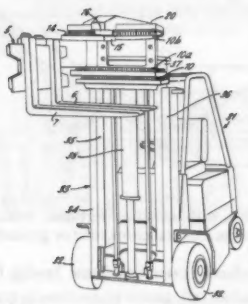
Cecil Goodacre, Oakley, near Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, England

Filed Feb. 9, 1978, Ser. No. 876,267

Claims priority, application United Kingdom, Feb. 10, 1977, 5463/77

Int. Cl.² B66F 9/14

U.S. Cl. 414—666 **9 Claims**



9. An industrial truck having an elongate body in which a load carrier, such as a pair of lifting tines, is mounted on a support which is pivotally mounted about an upright axis at one end of a boom which is mounted lengthwise of the truck and bodily movable along and across the truck, and the movement of the boom is constrained against rotation such that the end which supports the carrier is constrained to move along a D-shaped path which extends horizontally, the truck including a transmission for imparting rotary movement to the carrier in synchronism with movement of the said end around the arcuate part of the said path such that the movement of the end around the arcuate part of the path is automatically accompanied by swivelling of the load carrier about an axis spaced from the said axis.

4,218,171

PUBLIC WORKS MACHINE INCLUDING CONTROL JACKS IN A BOOM BALANCE ASSEMBLY

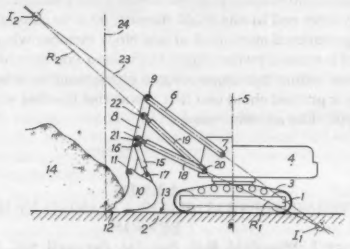
Gabriel L. Guinot, Le Plessis-Belleville, France, assignor to Societe Anonyme de Droit Francais, Poclain, Le Plessis-Belleville, France

Filed Apr. 21, 1978, Ser. No. 898,777

Claims priority, application France, May 4, 1977, 77 13570

Int. Cl.² E02F 3/75

U.S. Cl. 414—694 **10 Claims**



1. A public works machine comprising:

a frame;

a boom pivoted at a first pivot point to said frame;

a balance beam pivoted at a second pivot point to said boom;

a bucket;

means for coupling said bucket to said balance beam;

said bucket being adapted to rest on the ground during the loading thereof;

a first hydraulic jack pivoted at a third pivot point to said frame and at a fourth pivot point to said balance beam;

a second hydraulic jack pivoted at a fifth pivot point to said frame and at a sixth pivot point to said balance beam;

at least one pair of said third and fifth and said fourth and sixth pivot points being spaced apart;

a line and extensions thereof joining said first and second pivot points defining a first axis;

said bucket having first and second centers of rotation corresponding to functioning of said first and second hydraulic jacks respectively;

said first and second centers of rotation falling substantially on said first axis when said bucket is near the ground;

said first center of rotation being near ground level when said bucket is near the ground;

said second center of rotation being substantially vertically above said bucket when said bucket is near the ground in a loading position;

a line and extensions thereof joining said third and fourth pivot points defining a second axis;

said second axis passing through said first center of rotation;

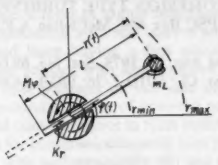
a line and extensions thereof joining said fifth and sixth pivot points defining a third axis; and

said third axis passing through said second center of rotation.

4,218,172
METHOD OF AND ARRANGEMENT FOR CONTROLLING MANIPULATORS AND INDUSTRIAL ROBOTS

Eckhard Freund, Karlsruhe-Bergwald, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,825
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656433
Int. Cl.² B25J 3/00
U.S. Cl. 414—730 **4 Claims**

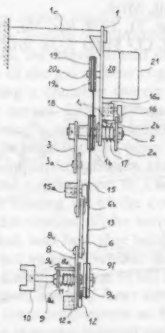


1. A system for controlling the rotational and translatory motions of a load using an industrial robot comprising:
(a) an actuator;
(b) shaft means for connecting said actuator to a load to be moved;
(c) first means generating a signal representative of the actual rotational and translatory motions of said shaft;
(d) second means for generating a signal representative of a predetermined sequence of rotational and translatory motions;
(e) third means for comparing the output of said first and second means;
(f) fourth means for generating a signal representative of variable moment of inertia and mass of said actuator and said load;
(g) fifth means for combining the output of said third and fourth means; and
(h) means for controlling said actuator in response to the output of said fifth means.

4,218,173
ROBOTS

Jacques Coindet, Valence, and Paul Romand, Bourg de Peage, both of France, assignors to Crouzet, Paris, France

Filed Jul. 12, 1978, Ser. No. 923,951
Claims priority, application France, Jul. 19, 1977, 77 22332
Int. Cl.² B66C 1/04
U.S. Cl. 414—730 **4 Claims**

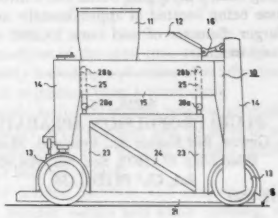


1. A robot comprising a chain of members connected in pairs and mobile with respect to one another and having a terminal member, a single motor and a selection means adapted to be controlled by a computer and a single monitoring coder whereby the motor drives selectively, by means of the selection means, each of the mobile members separately in a movement, for driving the terminal member of the chain in a determined movement, biasing means being provided for biasing each of said mobile members to rest position defined by the contact of two abutments, the motor acts positively in one direction to selectively actuate each of said mobile members against the action of said biasing means, and said members comprise a first plate rotatably mounted on a first shaft parallel to the axis of the motor, a second plate secured to a second shaft parallel to the axis of the motor, a deformable parallelogram connecting the two plates, a biasing member biasing the parallelogram to its rest position, a first drive drum fixed on the axis of the motor, a second drum mounted idle on the shaft of the first plate, a third drum fixed on the shaft of the second plate, a flexible drive cable fixed, at one of its ends, to said third drum, while being wound over at least one turn, on said second drum, and fixed, at the other of its ends, on said first drum, while being wound over several turns, the winding of the cable being such that a pull exerted on this cable by said first drive drum selectively provokes, via said selection means, either the rotation of said first shaft and therefore of said first plate, or that of said second shaft, or the deformation of said parallelogram, against the action of said biasing member.

4,218,174
LOAD-TRANSPORTING METHOD AND APPARATUS

Keijo K. Kröger, Tampere, and Pekka E. Ojanen, Pirkkala, both of Finland, assignors to Valmet Oy, Finland

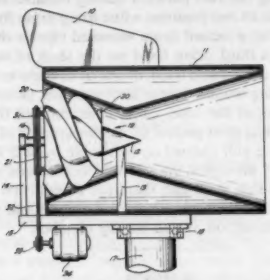
Filed Feb. 17, 1978, Ser. No. 878,755
Claims priority, application Finland, Feb. 18, 1977, 770539
Int. Cl.² B66F 9/00
U.S. Cl. 414—786 **10 Claims**



1. In a method for transporting a load which initially rests on a given surface, the steps of engaging the load with a load-carrier means which after engaging the load is capable of elevating the load above said given surface when said load carrier means is elevated with respect to said given surface, said load-carrier means being attached to a transporting vehicle for movement with respect thereto in a direction which elevates said load-carrier means with respect to said given surface when the vehicle travels with respect to the load while the load-carrier means engages the load to resist movement of the load-carrier means with the travelling vehicle, and propelling the vehicle while the load-carrier means remains in engagement with the load, the load-carrier means being attached to the vehicle for swinging movement with respect thereto about at least one axis which extends transversely with respect to the direction in which the vehicle is propelled and which is situated at an upper part of the load-carrier means, to utilize the force of friction of the load with respect to said given surface and the inertia of the load as well as the kinetic energy of the travelling vehicle to initially tend to cause the connection between the vehicle and the load through the load-carrier means attached to the vehicle to cause the vehicle to press more forcefully against the surface on which the vehicle travels while the continued propelling of the vehicle which is

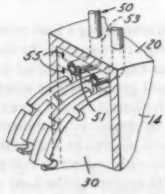
resisted by the load connected to the vehicle through the load-carrier means causes the load-carrier means to swing with respect to the vehicle about said axis to elevate the load with respect to said given surface.

4,218,175
WIND TURBINE
Robert D. Carpenter, 16214 Pasada Dr., Whittier, Calif. 90603
Filed Nov. 28, 1978, Ser. No. 964,344
Int. Cl.[2] F03D *1/04*
U.S. Cl. 415—2 **3 Claims**



1. A wind turbine consisting of a cone with a plurality of vanes extending outwardly more or less perpendicular to the surface of the cone and winding more or less in a helical fashion from a smaller diameter of the cone, but with a changing pitch angle and terminating or or near the large diameter of the cone; a shaft communicating with said cone at the center line of said cone; a wind tunnel surrounding said cone, comprising a converging inlet; a diverging outlet and a throat area; the tip of said cone being located at approximately said throat area and the larger diameter of said cone located at or near the outlet of said tunnel.

4,218,176
FLUID PROPULSION APPARATUS
Gordon S. Gawne, 840 Roeser St., Freeland, Mich. 48623
Filed May 17, 1978, Ser. No. 906,486
Int. Cl.[2] F01D *1/36*
U.S. Cl. 415—90 **10 Claims**

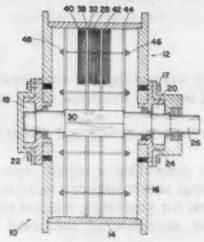


1. In a fluid propulsion apparatus including a generally circular hollow housing having opposed side walls, a shaft rotatably mounted in said housing, a plurality of spaced apart circular discs mounted on the shaft for rotation therewith, interiorly of said housing, said discs being concentric relative to said housing, a circumferential peripheral zone defined as the region between the interior of the housing and the periphery of said discs, a first fluid port means and a second fluid port means, each of said fluid port means extending through said housing and in communication with the interior thereof so that a fluid stream entering one of said ports flows through said housing in a spiral path and exits from the other of said ports, the improvement comprising:

said first fluid port means including an elongated pitot-like flow path having a first end lying in and in communication with said peripheral zone, said flow path first end being essentially free of any taper and lying in a plane substantially normal to the flow path within said peripheral zone;

said flow path having a cross-sectional area at said first end not greater than about 60 percent of the cross-sectional area of a strip of the peripheral zone lying in said plane and bounded by the radial limits of said first end of said flow path and bounded axially by the opposed side walls of said housing.

4,218,177
COHESION TYPE TURBINE
Robb W. Robel, PSC Box 486, McClellan A.F.B., Sacramento, Calif. 95652
Filed Aug. 23, 1979, Ser. No. 69,065
Int. Cl.[3] F01D *1/36;* **F03B** *5/00*
U.S. Cl. 415—90 **7 Claims**



1. A cohesion-type turbine comprising:

a housing;

a shaft rotatably mounted in said housing;

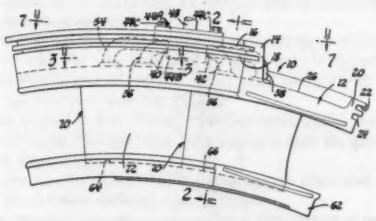
first and second series of thin, polished discs mounted on said shaft to rotate therewith;

means spacing said discs;

a nozzle mounted on said housing in alignment with said first series of discs to direct jets of fluid in spacers therebetween and along chords thereof; and

a transition duct on said housing having an inlet opening disposed to receive fluid emerging from said first series and an outlet in alignment with said second series to direct a stream of fluid along chords thereof.

4,218,178
TURBINE VANE STRUCTURE
John A. Irwin, Greenwood, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 31, 1978, Ser. No. 892,392
Int. Cl.[2] F01D *5/18, 9/02*
U.S. Cl. 415—114 **4 Claims**



1. A water cooled turbine nozzle vane removable sector assembly comprising: an outer shroud adapted to be removably supported on a turbine case and having a water inlet pair and

a water outlet pair, a fluid header with water inlet and outlet means thereon, means including tubes supporting said fluid header radially outwardly of said outer shroud and to fluidly and directly mechanically couple said header with said water inlet pair and said water outlet pair whereby the fluid header is removable from a turbine case as part of the sector assembly, a vane platform located in spaced relationship to said shroud, a pair of turbine vanes extending radially between said shroud and said platform to form a gas turbine motive fluid passage therethrough, means for connecting each of said vanes to said shroud and said platform to laterally seal said motive fluid passage between said turbine vanes, each of said vanes including an internal core having an aerodynamically configured smooth outer surface with a leading edge and continuously formed convex and concave surfaces, said core further including a trailing edge, a layer of highly heat conductive material in juxtaposed relationship with said convex and concave walls of said core, said layer having a first plurality of grooved passages in sealed contact with said concave surface to form multiple water inlet passages on one side of said vane, said layer having a second plurality of grooved passages in sealed contact with said convex surface to form multiple water return passages, means for communicating said inlet passages and said return passages with said water inlet pair and said water outlet pair on said shroud, and a super alloy heat resistant outer cover overlying said layer of highly heat conductive material in conductive heat transfer contact with the full planar extent of the outer surface of said layer to direct heat from said cover to water flowing through said grooved passages.

4,218,179

ISOTHERMAL AEROFOIL WITH INSULATED INTERNAL PASSAGEWAY

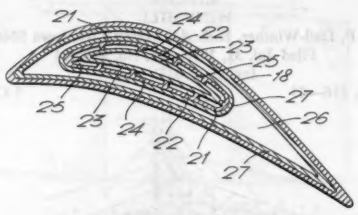
Brian Barry, Duffield, England, and David W. Artt, Belfast, Northern Ireland, assignors to Rolls-Royce Limited, London, England

Filed May 30, 1978, Ser. No. 910,753

Claims priority, application United Kingdom, Jul. 22, 1977, 30808/77

Int. Cl.³ F01D 5/08

U.S. Cl. 415—114 **5 Claims**



1. In a gas turbine engine having compressor means with at least a low pressure section, combustion means and turbine means in flow series, the improvement in an aerofoil blade in the hot gas stream of the gas turbine engine comprising:

a heat pipe having a chamber therein closed at both ends with capillary means within the chamber, said heat pipe further containing a small amount of a heat transfer medium in the chamber capable when subjected to heat of melting, subsequent vaporization and then transportation by vapor pressure differences to a cooler region for condensation and heating up of the cooler region whereby temperature distribution of the aerofoil blade is substantially isothermal, said heat pipe being defined by an outer tubular wall and an inner tubular wall, said outer tubular wall forming a major portion of the aerofoil blade's external configuration, and said inner tubular wall having substantially the same temperature as the outer tubular wall and defining a spanwise internal passageway through the aerofoil blade;

a secondary structure extending completely through said internal passageway of the aerofoil blade, said secondary structure about the exterior thereof being spaced from said inner tubular wall to define a spanwise space extending completely through the aerofoil blade;

a cooling fluid flowing from the low pressure section of said compressor means into, through and out of said spanwise space between the secondary structure and said inner wall of said heat pipe, said cooling air thermally insulating and cooling said secondary structure from the inner wall and outer wall which define the heat pipe of the aerofoil blade.

4,218,180

COMPACT TURBO MACHINE

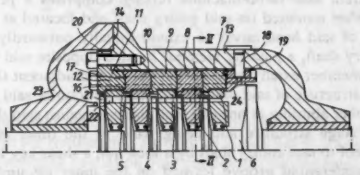
Rolf Wikstrom, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Sweden

Filed Jul. 5, 1978, Ser. No. 922,252

Claims priority, application Sweden, Jul. 12, 1977, 7708074

Int. Cl.² F01D 25/24, 9/02

U.S. Cl. 415—138 **8 Claims**



1. A turbo-machine of the axial type comprising:

a rotor assembly including a plurality of axially spaced rotor blades each extending from a rotor shaft;

a stator assembly including a stator housing surrounding said rotor assembly, with opposed end portions of said stator housing contacting and forming bearing surfaces with portions of said rotor shaft;

a plurality of divided partition wall sections axially spaced from one another within said stator housing, with each partition wall section including a guide vane assembly attached thereto, said divided partition wall sections being positioned such that a separate rotor blade extends between each pair of adjacent vane assemblies;

a plurality of continuous guide ring members equal in number to said partition wall sections also positioned within said stator housing, with each of said guide ring members surrounding and supporting a separate divided partition wall section;

means for attaching each of said partition wall sections to a surrounding guide ring member to allow for relative radial thermal expansion between said partition wall segment and said surrounding guide ring member;

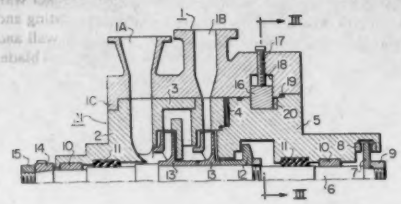
wherein said means comprises outer wall surfaces of said partition wall sections initially contacting inner wall surfaces of said respective surrounding ring members only at a plurality of circumferentially spaced portions to allow for thermal expansion of said partition wall sections relative to said respective surrounding ring members; and

further means for attaching said ring members to said stator housing to allow for both axial and radial thermal expansion of said rings relative to said housing during operation of said turbo-machine.

4,218,181
BARREL TYPE CENTRIFUGAL TURBO-MACHINE

Kazuhiro Komatsu; Kunio Kamata, and Kenichi Kasai, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 30, 1978, Ser. No. 891,626
Claims priority, application Japan, Nov. 21, 1977, 52-138973
Int. Cl.[2] F04D *29/44*; F01D *25/24*; B23P *15/00*
U.S. Cl. 415—189 7 Claims

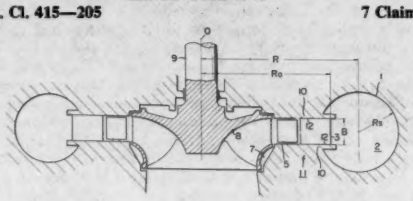


1. A barrel-type centrifugal turbo-machine comprising an outer casing and an inner casing assembly fitted in said outer casing, said inner casing assembly comprising a rotary shaft, a plurality of impellers fixed on said rotary shaft, a plurality of stage structures provided around said plurality of impellers, a head cover attached to one end stage structure of said plurality of stage structures, and a resilient means mounted in an axial gap between said one end stage structure and said head cover, wherein said turbo-machine further comprises a projecting member mounted on said rotary shaft and located at an axial end of said head cover to extend radially outwardly of said rotary shaft, a pushing member located opposite said projecting member axially of said rotary shaft and adjacent the other end structure of said plurality of stage structures, said pushing member abutting at one end wall thereof against said the other end stage structure and being fixed at the other end wall thereof to said rotary shaft by a lock nut, a shear key inserting circumferential groove formed on the inner circumferential surface of said outer casing against which said inner casing assembly is clamped, a shear key receiving annular groove formed on the outer circumferential surface of said head cover, said shear key receiving annular groove being larger in width than said shear key inserting circumferential groove by an amount corresponding to at least the width of said axial gap mounting said resilient means therein so that said former groove extends a larger distance than said latter groove axially of the rotary shaft along the inner circumferential surface of said outer casing against which said inner casing assembly is clamped, a shear key positioned in said grooves, said shear key being movable vertically between said shear key inserting circumferential groove and said shear key receiving annular groove, means being provided on said outer casing for effecting movement of said shear key into said shear key receiving annular groove, a radially inwardly projecting shoulder formed at one end of the inner circumferential surface of the outer casing against which said inner casing assembly is clamped, and a cutout complementary with said shoulder formed at one end of the outer circumferential surface of the inner casing assembly at which the inner casing assembly is clamped against the outer casing, whereby the assembly of said turbo-machine is facilitated in that said resilient means interposed between said one end stage structure and said head cover can be axially compressed to form the inner casing assembly into a unitary structure as said lock nut is tightened to clamp the inner casing assembly axially of said rotary shaft through said pushing member, the unitary structure can be fitted into said outer casing in such a manner that said shoulder is brought into engagement with said cutout, and the reafter the inner casing assembly can be fixed to said outer casing by moving said shear key from said shear key inserting circumferential groove into said shear key receiving annular groove after which said lock nut is loosened.

4,218,182
CASINGS OF HYDRAULIC MACHINES

Sachio Tsunoda, and Kiyoshi Harada, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 6, 1978, Ser. No. 949,094
Claims priority, application Japan, Oct. 20, 1977, 52-126060
Int. Cl.[3] F03B *3/02*
U.S. Cl. 415—205 7 Claims

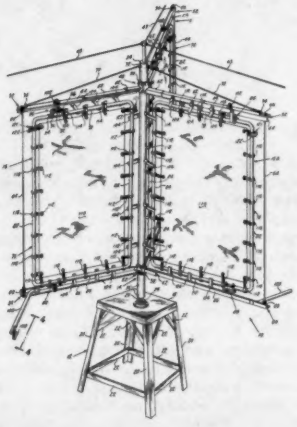


1. In a casing of a hydraulic machine forming a turbine of the type comprising a stay ring including a pair of opposing annular plates and a plurality of stay vanes fixed therebetween to form stay vane flow passages between said stay vanes, and a spiral case disposed on the radially outside of said stay ring, the improvement wherein said stay vane passages and said spiral case are proportioned such that the ratio of n of the area $2\pi R_o B$ of a circle encircling the outer periphery of said stay vanes and the cross-sectional area πR_s^2 of the flow passage in said spiral case is from 1.5 to 2.1, and that the ratio $(R-R_o)/R_s=l$ is larger than 0.75 where R_s represents the radius of the cross-section of the flow passage in said spiral case taken along a plane containing the axis of the shaft of said hydraulic machine and intersecting at right angles with the axis of an inlet to said spiral case, R the distance between the axis of said shaft and the center of said flow passage in said spiral case, R_o the radius of said stay vanes to the outer periphery thereof, and B the height of the stay vane flow passages at the periphery of said stay vanes.

4,218,183
WINDMILL

Dennis P. Dall-Winther, R.R. #4, Mason City, Iowa 50401

Filed Jul. 31, 1978, Ser. No. 929,254
Int. Cl.[3] F03D *7/06*
U.S. Cl. 416—41 7 Claims



1. A windmill comprising:
a support base,

a vertical shaft mounted to said base for rotation abouts its longitudinal axis,

a plurality of pairs of vertically spaced parallel horizontal arms defining respective upper and lower arms each with respective inner and outer ends,

means securing each pair of arms at respective inner ends to said shaft so as to extend radially therefrom in equidistant relationship about the perimeter of said shaft,

a respective substantially rectangular open frame disposed between each pair of arms and hingedly secured thereto near said respective outer ends whereby said frame can swing to a closed position of alignment with said arms and to an open position out of alignment with said arms,

a respective radial stop member on said shaft in alignment with respective pairs of arms and disposed to intersect the path of movement of said respective frames so as to limit said movement in one direction,

a respective vane having top and bottom ends and releasably secured at said top end to and within the confines of said respective frames, and

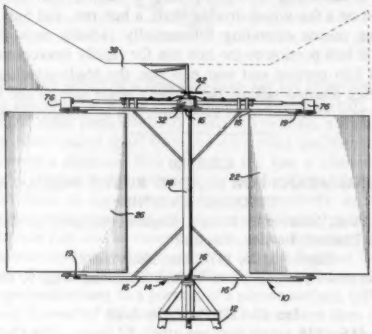
means responsive to extreme wind forces acting on said vanes to effect their release at said top end from said frame whereby said vanes collapse by gravity for reducing the wind catching capability of said vanes when said frame is in closed position.

4,218,184

WINDMILL CONSTRUCTION

William E. McPherson, Drawer V, Hale Center, Tex. 79041, and David W. Rowe, Plainview, Tex., assignors to William E. McPherson, Hale Center and Gary W. Harrell, Plainview, both of, Tex., part interest to each

Filed Jun. 23, 1978, Ser. No. 918,961
Int. Cl.³ F03D *7/06*
U.S. Cl. 416—17 **6 Claims**



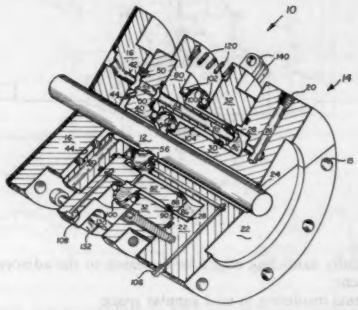
1. A windmill including a base, a rotor journaled from said base for rotation about a first axis, said rotor including a plurality of vanes journaled therefrom for rotation about second axes spaced about and radially outwardly from said first axis, vane displacement control means operatively connected between said base and vanes for proportionally angularly displacing said vanes relative to said rotor 180° in one direction during each 360° of rotation of said rotor in the opposite direction, said vanes being angularly displaced in optimum positions relative to said rotor and each other to develop maximum thrust from said vanes on said rotor to rotate the latter in said opposite direction responsive to fluid flow against said vanes from a predetermined side of said first axis, a wind direction sensing tail pivotally supported for swinging about an axis generally paralleling said first axis and operatively connected between said rotor and said vane displacement control means for maintaining the optimum positions of said vanes relative to each other and said rotor during changes in the direction of fluid flow, relative to said base, against said vanes, and with one of said vanes substantially paralleling said tail when said one vane is moving in a direction opposite to the direction in which said tail is swung, and excess rotor rotation speed override control means operatively connected between said vane displacement control means and wind direction sensing tail operative to controllably angularly displace all of said vanes other than said one vane from said optimum positions thereof to positions paralleling said one vane.

4,218,185

FLEXIBLE FLUID CONDUIT FOR PROPELLER SHAFT

Joseph J. Trytek, 7333 W. Gregory, Chicago, Ill. 60656

Filed Apr. 3, 1978, Ser. No. 892,964
Int. Cl.³ B63H *1/18*
U.S. Cl. 416—20 R **5 Claims**



1. A split fluid conduit adapted to be mounted about a propeller shaft for transmitting air from an A-bracket to a propeller for minimizing cavitation, said conduit permitting axial and bending movement of said propeller shaft, said conduit comprising:

(a) An annular mounting member having an aperture extending therethrough for mounting over a propeller shaft, said member adapted to be attached to an A-bracket of a ship and having fluid conduit for receiving fluid and transferring same towards said propeller;

(b) A fluid transfer member having conduit means extending into the fluid conduit of said annular mounting member, said conduit means being coupled to said fluid conduit by means permitting relative axial and bending movement between said conduit means and said fluid conduit, said coupling including sealing means for precluding loss of fluid;

(c) Seal means interposed between said fluid transfer member and said propeller, said seal means including passage means for transferring fluid from the fluid transfer member to said propeller, and a radially extending sealing surface on opposite sides of said passage means for precluding loss of fluid.

4,218,186

INSULATED HUB ARRANGEMENT FOR HIGH TEMPERATURE CENTRIFUGAL FAN

Robert S. Teager, Framingham, and Richard S. Galvin, Hingham, both of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

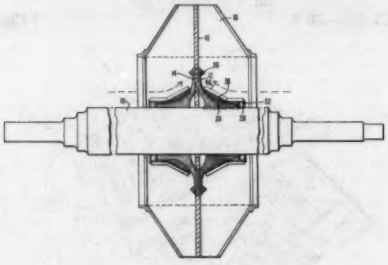
Filed Oct. 25, 1978, Ser. No. 954,721
Int. Cl.² F04D *29/28, 29/58*
U.S. Cl. 416—95 **5 Claims**

1. In a centrifugal fan of the type having a thermally insulated hub, an improved heat shielding and insulating arrangement for that type of hub which is a one-piece member having an axially extending root portion which is heat shrunk on onto a rotary shaft and turns up at its inner end and terminates in a

radially extending flange lying in a plane normal to the axis of the shaft, and which has the radially inner portion of a wheel plate secured by fasteners to the flange, comprising:

a collar encircling and secured to said shaft at the outer end of said root portion;

a heat shield including a circumferential portion having a shape generally following the contour of said root portion in sufficiently spaced apart relation with the outer surface of said root portion to form an annular space therebetween to accommodate a depth of thermal insulation determined in accordance with the temperature variation design conditions for the fan, said circumferential portion comprising at least a pair of circumferentially extending segments, each of which includes means along its opposite



axially extending edges for fastening to the adjacent segment;

thermal insulation in said annular space;

means fastening said circumferential segments to said root portion;

an end disc for said shield having a central opening to accommodate said shaft in relatively close fitting relation to substantially minimize leakage of hot gases handled by said fan into the space in said cover adjacent said collar;

means securing said end disc in fixed relation to said collar and said circumferential portion; and

said circumferential portion being unattached to said wheel plate so that movement of said plate in accordance with temperature changes thereof is not directly translated to said circumferential portion.

4,218,187

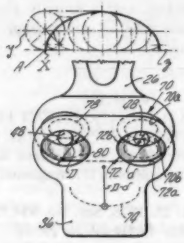
CONSTANT FREQUENCY BIFILAR VIBRATION ABSORBER

John F. Madden, West Haven, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1978, Ser. No. 931,034

Int. Cl.[2] B64C *27/32*

U.S. Cl. 416—145 **4 Claims**



1. A bifilar vibration absorber for a helicopter main rotor including a support rotatable with the rotor having two contoured holes, a pendulous mass having two contoured holes aligned with the holes in said support, roll pins extended through said aligned holes in said support and said mass, the contour of said holes over which said pins roll providing a continuously decreasing radius of curvature of the path of movement of the cg of said mass with changes of amplitude of said mass from its zero amplitude position.

4,218,188

AXIAL FAN

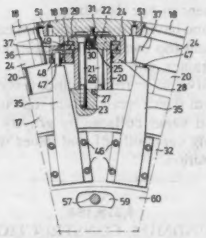
Edgar Säterdal, Rottne, Sweden, assignor to Aktiebolaget Svenska Fläktfabriken, Nacka, Sweden

Filed May 11, 1978, Ser. No. 905,028

Claims priority, application Sweden, May 17, 1977, 7705826

Int. Cl.[2] F04D *29/36*

U.S. Cl. 416—172 **7 Claims**



1. An axial fan having an impeller with settable blades, the root end of each blade connecting, via a bearing permitting rotation of the blade, to an outer end of an axially-extending blade-attachment shaft extending substantially radially relative to the fan wheel, said shaft being rigidly connected at its inner end to a fan-wheel hub comprising a central hub portion mounted on a fan-wheel driving shaft, a hub rim, and hub rim mounting means extending substantially radially outwardly from said hub portion to the hub rim for rigidly interconnecting said hub portion and said hub rim, the blade-attachment shaft being abutted against the radially outer side of the hub rim and pre-tensioned in its axial direction by compression.

4,218,189

SEALING MEANS FOR BLADED ROTOR FOR A GAS TURBINE ENGINE

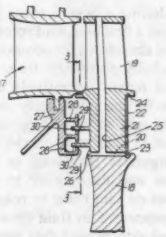
George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

Filed Jul. 28, 1978, Ser. No. 928,982

Claims priority, application United Kingdom, Aug. 9, 1977, 33253/77

Int. Cl.[3] F01D *11/00, 5/18*

U.S. Cl. 416—174 **8 Claims**



1. A bladed rotor and adjacent static structure for a gas turbine engine comprising:

a rotor disc having a plurality of blade retaining slots in its periphery;

a plurality of rotor blades each having a blade root mounted in one of said slots; and

sealing means between the rotor and the adjacent static structure, said sealing means including an annular projection carried by the rotor adjacent said rotor disc periphery, and an annular projection carried by the static structure and arranged to coact with the annular projection carried by the rotor from adjacent said rotor disc periphery, said annular projection carried by the rotor from adjacent said disc periphery being defined by a plurality of abutting segments, alternate ones of which project from said rotor disc and said rotor blades respectively, said abutting segments having abutting faces angled in a direction relative to a radially extending plane through the axis of the engine whereby centrifugal forces on said rotor blades cause said abutting faces to be forced into sealing engagement.

4,218,190

FLAT-BLADED FAN WHEEL OF DIAGONAL-FLOW FAN

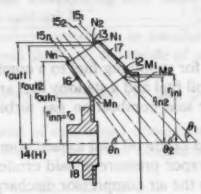
Yoshiyasu Nishikawa, Ono, and Masao Nakano, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Apr. 26, 1978, Ser. No. 900,646

Claims priority, application Japan, Jun. 29, 1977, 52/78167

Int. Cl.³ F01D *5/22*

U.S. Cl. 416—186 R **2 Claims**



1. A fan wheel of a diagonal-flow fan for propelling a flow of a gas, said fan wheel comprising: a rotational shaft, a frustoconical main plate coaxially fixed to the shaft, a frustoconical side plate spaced apart from the main plate and forming therebetween a diagonal flow path for the gas, a plurality of fan blades disposed circumferentially of the diagonal flow path, each fixed at opposite side edges respectively to the inner surfaces of the main and side plates, said blades having an inner entrance part and an outer exit part, said entrance and exit part respectively, extending transverse to said diagonal flow path, each of said fan blades being defined by a plate having a surface shape conforming to a portion of a planar surface, said portion being formed of successive mutual intersection lines (15_1, 15_2, 15_3, . . . 15_{n-1} and 15_n) between said planar surface and successive coaxial conical surfaces (15_{11}, 15_{21}, 15_{31}, . . . and 15_{n1}), corresponding to ideal stream surfaces, having a common centerline axis (H) and coinciding with the axis (14) of said rotational shaft, said planar surface being in parallel relation to a line (W) which crosses said axis (14) of the rotational shaft at an angle (K) therewith, said planar surface being at an angle (β_{11a}) with a plane passing through both said line (W) and said axis (14) of the rotational shaft.

4,218,191

MULTI-CONSTRAINT CONTROL OF A COMPRESSION SYSTEM

William S. Stewart, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1978, Ser. No. 964,327

Int. Cl.² F04B *49/06*

U.S. Cl. 417—19 **14 Claims**

1. Apparatus comprising:

a compression system having at least one compressor means, said compression system having a suction inlet and a discharge outlet;

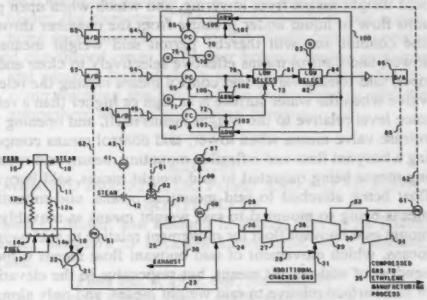
means for driving said compression system;

means for establishing a first signal representative of the suction pressure at the suction inlet of said compression system;

means for establishing a second signal representative of the desired suction pressure at the suction inlet of said compression system;

means for comparing said first signal and said second signal and for establishing a third signal responsive to the difference between said first signal and said second signal;

means for establishing a fourth signal representative of the discharge pressure at the discharge outlet of said compression system;



means for establishing a fifth signal representative of the highest allowable discharge pressure at the discharge outlet of said compression system;

means for comparing said fourth signal and said fifth signal and for establishing a sixth signal responsive to the difference between said fourth signal and said fifth signal; and

means for manipulating the speed of said means for driving said compression system in response to said third signal if the pressure represented by said fourth signal is less than the pressure represented by said fifth signal and for manipulating the speed of said means for driving said compression system in response to said sixth signal if the pressure represented by said fourth signal is greater than the pressure represented by said fifth signal.

4,218,192

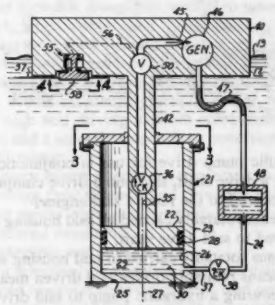
PRESSURE SOURCE

William S. West, 939 W. Arcadia Ave., Arcadia, Calif. 91006

Filed Mar. 28, 1977, Ser. No. 781,852

Int. Cl.² F04B *17/00*

U.S. Cl. 417—333 **1 Claim**



1. A pressure source to develop a stream of liquid under

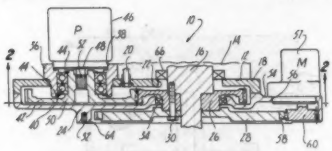
pressure as the consequence of the rise and fall of the surface of a body of water, comprising: pressurizing means comprising an enclosure which bounds a chamber, said enclosure comprising a first and a second portion, at least one of which portions is movable relative to the other as a consequence of a force applied to one of them so as to reduce the volume of the chamber and thereby to place under pressure liquid which is contained therein; a conduit leading from said chamber through which a stream of liquid under pressure can flow for doing work; buoyant weight means floatable in said body of water; force transmission means so disposed and arranged as to apply force from said weight means to said one portion when said weight means is elevated; an open-closed release valve in said conduit which when closed prevents flow of liquid from the chamber through the conduit and will thereby also prevent said weight means from lowering, and which when open permits flow of liquid under pressure from the chamber through the conduit and will thereby permit said weight means to lower; and control means effective selectively to close and to open said release valve, said control means closing the release valve when the water surface is as high or higher than a reference level relative to the weight means itself, and opening the release valve means when lower, said control means comprising a buoyant float and inflexible mounting means, said mounting means being mounted to said weight means, said buoyant float being attached to said mounting means, said mounting means being so mounted to said weight means as movably to mount said buoyant float for movement relative to said weight means, which movement of said buoyant float means is independent of said weight means, but responsive to the elevation of said surface relative to said weight means, and only along a single unique and invariable path relative to said weight means, whereby the location of the buoyant float relative to the weight means, and the control condition of the control means are uniquely a function of the elevation of said surface relative to said weight means, said mounting means is a rigid shaft vertically shiftably mounted to said weight means, said shaft depends downwardly from the bottom of said weight means, and in which said control means controls said valve in such a manner that said buoyant float extends for a sufficient distance beneath the bottom of said weight means when it opens said valve that said surface of water is out of contact of said weight means.

4,218,193

HYDRAULIC PUMP DRIVE

John T. Mehne, Muskegon, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 8, 1976, Ser. No. 674,778
Int. Cl.[2] F24B *17/00*; F16H *37/00*
U.S. Cl. 417—364 **6 Claims**



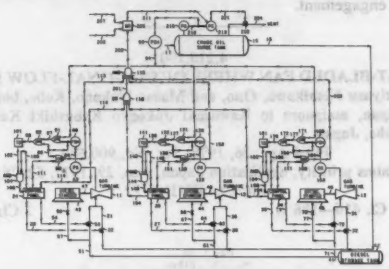
1. A hydraulic pump drive for use in conjunction with an engine having a drive shaft, said pump drive comprising:
a housing secured to the rear of said engine,
a driving means rotatably carried by said housing and coaxially secured to said drive shaft,
a driven means rotatably carried in said housing so that said driving means rotatably drives said driven means,
means for securing a hydraulic pump to said driven means,
said housing having a base and a reservoir formed in said base for containing a lubricant, and
means for supplying lubricant from said engine to said housing and said housing having a reservoir for containing said lubricant,
said last-mentioned means comprises a dam formed in said reservoir and a passageway from one side of the dam to the engine.

4,218,194

VAPOR PRESSURE CONTROL SYSTEM FOR GAS TURBINE FUEL

Martin R. Reber, and Leland G. Kitchen, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 25, 1978, Ser. No. 945,713
Int. Cl.[2] F04B *17/00*; F02C *3/24*
U.S. Cl. 417—364 **33 Claims**



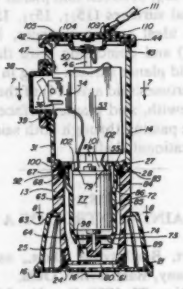
1. A method for supplying fuel to a combustion gas turbine, where a crude oil fuel and a standby fuel are available as alternative fuels for said combustion gas turbine, comprising the steps of:
supplying said crude oil fuel to said combustion gas turbine when the vapor pressure of said crude oil fuel is equal to or less than the air compressor discharge pressure for said combustion gas turbine; and
supplying said standby fuel to said combustion gas turbine when the vapor pressure of said crude oil fuel is greater than said air compressor discharge pressure for said combustion gas turbine.

4,218,195

SUBMERSIBLE PUMP

Alan Shure, Chicago, Ill., assignor to International Components Corporation, chicago, Ill.

Filed Feb. 2, 1979, Ser. No. 9,262
Int. Cl.[3] F04B *35/04*
U.S. Cl. 417—411 **5 Claims**



1. A submersible pump having:
a rechargeable battery power source;
a recharging circuit for said battery;

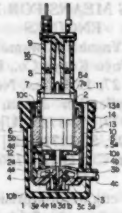
a motor with a drive shaft;
an on/off switch electrically connecting said battery to said motor;
a pumping chamber, including an inlet and an outlet;
an impeller disposed in said pumping chamber;
an upper sealable compartment having a top end and a lower open end;
said upper compartment containing said battery, said recharging circuit, and said switch;
inwardly projecting means in said upper compartment positioning said battery;
a recharging receptacle for said recharging circuit mounted on said top end;
resilient cover means sealing said switch while permitting actuation of said switch from outside of said upper compartment;
a cap carrying first sealing means engageable with said top end to seal recharging receptacle;
a lower sealable compartment having a bottom end and an upper open end;
said lower compartment housing said motor, said pumping chamber, and said impeller;
a bullet-shaped shell seated in said lower compartment;
second sealing means between the seated shell and said lower compartment;
an opening in tip of said shell;
said motor disposed in said shell with said drive shaft projecting through said opening;
third sealing means surrounding said drive shaft between said motor and said tip;
said pumping chamber comprising an annular space between the outside of said shell and the inside of said lower compartment;
said impeller drivingly mounted on said projecting drive shaft; and
said lower open end of said upper compartment and
said upper open end of said lower compartment are sealed together.

4,218,196

MOTOR FUEL PUMP

Shunsaku Ohnishi, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 28, 1978, Ser. No. 964,793
Claims priority, application Japan, Dec. 5, 1977, 52-163077[U]
Int. Cl.[2] F04B *17/00, 35/04*
U.S. Cl. 417—424 **1 Claim**



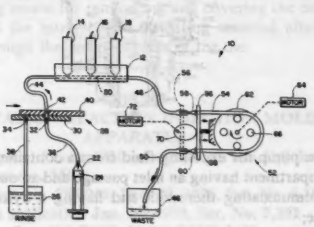
1. A motor fuel pump comprising:
a cup-shaped cover with its open end on top
a cylindrical motor housing of magnetic material secured into said cover with its axis in alignment with the axis of said cover;
a brush holder having electric terminals, brushes, springs and a first bearing and secured to said motor housing at the top portion thereof;
an armature disposed beneath said brush holder and having a shaft carried by said bearing at its one end and a commutator in contact with said brushes;
permanent magnets secured to said motor housing around said armature;
an end housing secured to said motor housing for defining a motor unit, said end housing having a second bearing for carrying the other side of said shaft;
a pump housing disposed at the bottom of said motor housing and having a frustum-shaped ceiling member, a bottom member with a fuel inlet and a fuel outlet extending out of said cover, said ceiling member having a central opening opened at the top thereof;
a centrifugal pump impeller carried by said shaft and disposed in said pump housing below said central opening to be rotated by the motor unit and having a center boss connected to said shaft, a plurality of axially and outwardly extending blades evenly disposed in a circumference and a flat member for securing said center boss and blades, the diameter of the inner periphery of said blades being approximately equal to that of said central opening;
said cup-shaped cover and motor housing having apertures and passages formed above said central opening thereby communicating the inside of the pump housing and the atmosphere through said central opening.

4,218,197

COMBINED PERISTALTIC PUMP AND VALVE FLOW CONTROLLER

Richard C. Meyer, and Edmund E. Buzza, both of La Habra, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 6, 1978, Ser. No. 922,457
Int. Cl.[2] F04B *43/12, 45/08;* G01N *27/26*
U.S. Cl. 417—442 **8 Claims**



1. A fluid flow control system comprising:
a flow cell having a passage therein for accommodating fluid flow therethrough;
conduit means connected to said passage for directing fluid to and from said flow cell, said conduit means including an elastomeric tubular section;
peristaltic pump-valve means including (1) said elastomeric tubular section of said conduit means, (2) a fluid driving member movable along said section to pump fluid therethrough when compressed thereagainst, (3) means for actuating said fluid driving member, and (4) means for selectively moving one of said section and driving member toward and away from the other thereof to selectively define a first or pumping condition for said peristaltic pump with said driving member compressed against said section and a second or open flow condition through said conduit means;
fluid delivery means selectively connected to said flow cell for flowing fluid through said flow cell passage and said conduit means when said peristaltic pump-valve means is in its second condition;
a fluid reservoir, and
means for selectively connecting said fluid delivery means or said fluid reservoir to said flow cell, said peristaltic pump-valve means in said first condition being actuable to pump a first fluid from said reservoir through said flow cell passage and in said second condition accommodating flow

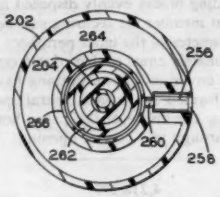
of a second fluid through said flow cell passage in response to said fluid delivery means.

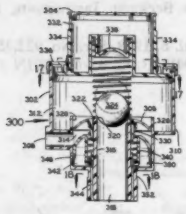
4,218,198

PUMP HAVING NON-THROTTLING PERIPHERAL VALVE

Louis F. Kutik, Ft. Lauderdale, and Howard E. Cecil, Miami Lakes, both of Fla., assignors to Security Plastics, Inc., Miami Lakes, Fla.

Filed Nov. 2, 1978, Ser. No. 957,056
Int. Cl.³ F04B 21/02; B67D 5/42
U.S. Cl. 417—566 **11 Claims**





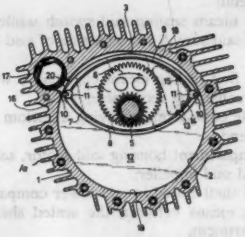
1. In a pump for expelling fluid from a container including:
a compartment having an inlet passage and an outlet passage communicating therewith and having a cylindrical surface;
an intake valve for said inlet passage;
an exhaust valve for said outlet passage;
said exhaust valve comprising a resiliently flexible flap having a circular sealing edge engaging said cylindrical surface and slightly larger in diameter before assembly than the diameter of said cylindrical surface so that said flap bends slightly and is self biased against said cylindrical surface, said flap dividing the interior of said compartment into an input chamber with which said inlet passage communicates and an output chamber with which said outlet passage communicates;
said compartment including an actuator depressible into said input chamber to expel fluid therefrom past said sealing edge through said output chamber and out said outlet passage, and said actuator being returnable to suck fluid through said inlet passage past said intake valve into said input chamber:
the improvement comprising:
means blocking off a portion of said output chamber to form a vent passage for communicating the container to the atmosphere;
resilient sealing skirt means associated with said blocking means for normally closing said vent passage and yieldable to admit air through said vent passage to the container when air pressure in the container is reduced in operation;
said flap being movable vertically;
and a spring biasing said flap upwardly.

4,218,199

ROTARY PISTON COMPRESSOR WITH NO NEGATIVE TORQUE

Dankwart Eiermann, Lindau, Fed. Rep. of Germany, assignor to Borsig GmbH and Wankel GmbH, both of Berlin, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,633
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743038
Int. Cl.² F04C 17/02, 29/08
U.S. Cl. 418—54 **2 Claims**



1. A rotary piston compressor of trochoidal type construction with a 1:2 step-up transmission gearing operative in slip contact, comprising: a housing forming a compressor space, a side inlet port means in the housing, said inlet port means having a control edge located in the leading direction of rotation, an eccentrically rotating lobed piston in the compressor space forming chamber therein and having a piston edge moving ahead of and coinciding with the said control edge shortly before said piston is located in its dead-center position, a peripheral outlet port in the housing means having a rear control edge and dead-center space in communication therewith, and a follower piston lobe which at the same time, shortly before said piston is located in its dead center position, traverses the peripheral outlet port means to uncover it, to allow communication with the dead-center space for permitting relief of gas pressure in one of the chambers formed with said piston to avoid creation of any negative torque otherwise encountered therewith, the control edge of the inlet port means which trails in the direction of rotation coinciding with a trailing piston edge portion when said follower piston lobe is behind the outlet port means in the direction of rotation.

4,218,200

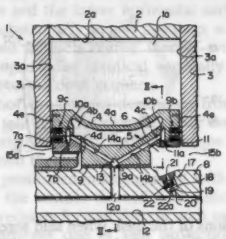
ROTOR COOLING MEANS FOR ROTARY PISTON ENGINES

Yasuyuki Morita, and Yasuhiko Iwamoto, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jun. 27, 1978, Ser. No. 919,453
Claims priority, application Japan, Jun. 30, 1977, 52-87258[U]; Jun. 30, 1977, 52-87259[U]; Aug. 30, 1977, 52-117138[U]; Aug. 30, 1977, 52-117139[U]
Int. Cl.² F01C 21/06
U.S. Cl. 418—84 **10 Claims**

2. In a rotary piston engine comprising a casing which includes a rotor housing and a pair of side housings having inner surfaces and being secured to the opposite sides of the rotor housing to define a rotor cavity, a substantially polygonal rotor having opposite side surfaces and flanks defined between apex portions, said rotor being disposed in the rotor cavity in the casing for rotation with the side surfaces in confronting relationship with the inner surfaces of the side housing, oil seal means provided on the side surfaces of the rotor for sliding engagement with the inner surfaces of the side housing; rotor cooling means comprising circumferentially extending first coolant passage means formed in said rotor and located axially behind the oil seal means, second coolant passage means formed in said rotor and located radially behind the flanks of

the rotor, means for providing continuous supply of coolant to said first coolant passage means, and means for providing supply of coolant to said second coolant passage means only on



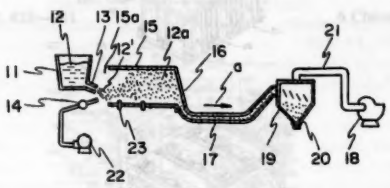
demand in accordance with engine operating condition, said first coolant passage means having outlet means directed axially outwardly from said first coolant passage means.

4,218,201

APPARATUS FOR PRODUCING SOLIDIFIED GRANULAR SLAG FROM MOLTEN BLAST FURNACE SLAG

Yusuke Kozima, Sakaishi; Hideo Matsui, Kawachinaganoshi, and Takao Chikakiyo, Sakaishi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,907
Int. Cl.[2] B22F *9/00*
U.S. Cl. 425—7 **5 Claims**



1. An apparatus for producing solidified granular slag from molten blast furnace slag, said apparatus comprising:

a vessel adapted to be positioned to receive molten slag from a blast furnace, said vessel having a slag hole for discharging therefrom said molten slag;

trough means, positioned to receive molten slag from said slag hole, for forming a discharged molten slag stream;

nozzle means, positioned below said slag stream, for directing a flat strip-shaped stream of air in an upwardly inclined direction against said slag stream, for thereby forming said slag stream into semi-solidified granular slag, and for entraining and carrying said semi-solidified granular slag along a path extending in a substantially horizontal direction;

collision plate means, positioned in said path of said semi-solidified granular slag, for causing said semi-solidified granular slag to collide with said collision plate means and drop downwardly;

an air transfer duct having a first end positioned to receive said semi-solidified granular slag which drops downwardly from said collision plate means and a second end;

a separator tank connected to said second end of said air transfer duct; and

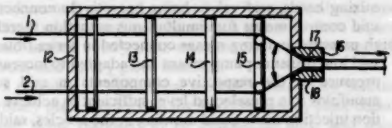
suction means, connected to said separator tank, for creating a vacuum in said separator tank and in said air transfer duct, and for thereby drawing air and said semi-solidified granular slag through said transfer duct, wherein said semi-solidified granular slag solidifies to form solidified granular slag, and into said separator tank, wherein said solidified granular slag is collected.

4,218,202

APPARATUS FOR MAKING REMOTE CONTROL CABLE

Pierre Seguin, Pont-de-Cheruy, France, assignor to Chavonoz SA, Chavanoz, France

Division of Ser. No. 769,338, Feb. 16, 1978, Pat. No. 4,135,056.
This application Jul. 7, 1978, Ser. No. 922,547
Claims priority, application France, Feb. 16, 1976, 76 04378
Int. Cl.[2] H01B *13/16*
U.S. Cl. 425—110 **2 Claims**



1. An apparatus for the manufacture of a remote control cable including a pair of conducting wires separated and secured by an intermediate holding support comprising:

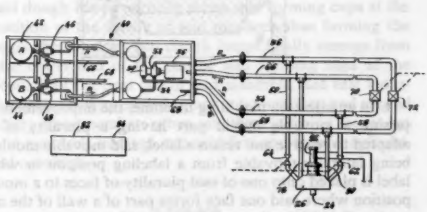
1. a tank for containing a fusible insulator material,
2. die means on said tank, said die means including
3. a gauging portion, and
4. a convergent portion to interior of said tank,
5. guide means including positioning guides in said tank adjacent said convergent portion for holding the conductors spaced from each other and in contact with the opposite surfaces of said gauging portion of the die, and
6. covering means for reinforcing and covering the conductors and the intermediate insulating material after they pass through the gauge portion of the die.

4,218,203

MULTI-STATION REACTION INJECTION MOLDING APPARATUS

Peter J. Tilgner, Akron, Ohio, assignor to The Upjohn Company, Kalamzoo, Mich.

Division of Ser. No. 755,048, Dec. 28, 1976, Pat. No. 4,150,074.
This application Jan. 29, 1979, Ser. No. 7,252
Int. Cl.[2] B29D *27/00*; B29G *3/00*
U.S. Cl. 425—110 **1 Claim**



1. Apparatus for multiple-station in-place foaming of a reactive polymeric resin composition in articles advancing along a production line;

conveyor means for advancing said articles, and means for diverting said articles, one to each of a plurality of pour stations adjacent said conveyor means, as the respective stations become available to receive an on-coming article;

a mixing head of the reaction injection molding type at each pour station, said heads being adapted to receive at least two different reactive liquid components, mix these and inject the mixture into the article at the pour station;

supply and recycle manifolds for each of said reactive liquid components, and supply and recycle shunt ducts interconnecting each mixing head with the respective manifolds,

whereby said mixing heads are disposed in parallel flow connection across said manifolds;

low pressure pump means adapted to continuously supply liquid components of preselected low pressure to each of said supply manifolds to cause component flow to divide among the parallel-connected mixing heads and return through said recycle shunt ducts and manifolds, whereby to maintain temperature and compositional uniformity of the several components at all of the heads of the system;

control means for selectively determining the order in which each pour station will inject foam mix into an article, and for initiating that operation;

shut-off valves between the respective supply and recycle manifolds and in the supply shunt ducts to each of said mixing heads, said valves being operatively connected to said control means for simultaneous actuation thereby;

high pressure metering means connected in series flow with said low pressure pump means and adapted to increase the pressure of the respective components in said supply manifolds to a preselected level sufficient to achieve reaction injection mixing and molding in the articles, said high pressure metering means also being operatively controlled by said control means;

said control means having provision for simultaneously energizing said high pressure metering means and closing all of said shut-off valves except that to the mixing head selected by said control means for initiation of reaction injection molding.

4,218,204

LABELLING

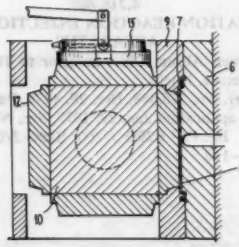
Frederick H. Edwards, Mentone, Australia, assignor to Vinyl Clad Proprietary Limited, Victoria, Australia

Filed Jan. 18, 1979, Ser. No. 4,553

Claims priority, application Australia, Jan. 19, 1978, PD3070

Int. Cl.[2] B29F *1/00*

U.S. Cl. 425—129 R **4 Claims**



1. In an injection moulding machine, the improvement comprising a movable mould part having a plurality of faces adapted to receive and retain a label, said movable mould part being laterally movable from a labeling position in which a label is placed onto one of said plurality of faces to a moulding position where said one face forms part of a wall of the mould cavity of said injection moulding machine.

4,218,205

THREE-SECTION SELF-SEALING DENTAL FLASK

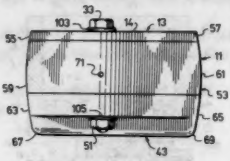
Richard A. Beu, Eggertsville, N.Y., assignor to Teledyne Hanau Division of Teledyne, Inc., Buffalo, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,720

Int. Cl.[2] B29D *31/00*; B29C *1/16*; A61C *13/08*

U.S. Cl. 425—180 **14 Claims**

1. A three-section, self-sealing dental flask which comprises a bottom section having an upper sealing surface, a middle section having upper and lower sealing surfaces and a cover section having a lower sealing surface, each of which sections has a substantially flat front and a rounded back and which sections, when assembled, form a molding cavity for a full denture, and sealing means at two sides of the flask middle section which, in conjunction with tightening screws, are capable of applying compressive sealing forces on the bottom



and cover sections of the flask when said screws are tightened so as to seal such flask with the sealing surfaces of the middle section thereof in sealing contact with corresponding sealing surfaces of the bottom and cover sections.

4,218,206

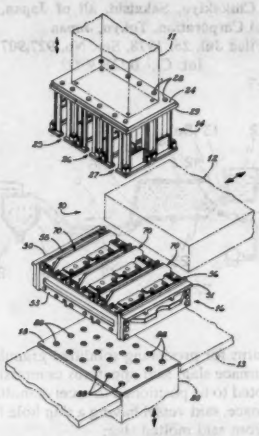
MOLD BOX APPARATUS

Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254

Filed Oct. 2, 1978, Ser. No. 947,590

Int. Cl.[2] A21C *3/00*

U.S. Cl. 425—253 **9 Claims**



1. A self-aligning mold box apparatus for casting mortarless interlocking cementitious blocks of the type having vertical side and end walls, upper and lower horizontal surfaces and a pair of spaced passages extending vertically therethrough which form substantially square openings with open corners in the upper horizontal surface and form substantially square openings in the lower horizontal surface with a corner corbel in each corner of the openings formed in the lower horizontal surface and a projection depending from each of the corner corbels, said self-aligning mold box apparatus comprising:

(a) a mold box die which is open at the top and bottom and has at least one compartment therein which forms the vertical side and end walls of the cementitious block when cement is deposited therein;

(b) a core die assembly mounted on said mold box die so as to span the open top thereof, said core die assembly having a spaced pair of core dies depending therefrom into the compartment of said mold box die to form the pair of vertical passages through the cementitious block when cement is deposited therein;

(c) each of the core dies of said core die assembly being of substantially square cross section with four corners at the

upper end thereof and having an inwardly flared cavity at each lower corner so that upon deposition of cement into said mold box die the upper horizontal surface of the cementitious block will have the pair of substantially square openings to provide a predetermined array of the open corners and the lower horizontal surface will have the pair of substantially square openings with the corner corbel formed in each corner thereof with the corner corbels arranged in an identical vertically aligned array with respect to the open corners;

(d) a plurality of projections depending from each of the core dies of said core die assembly with each of said projections located adjacent a different one of the flared cavities formed therein;

(e) a pallet die positioned in engagement with said mold box die to close the bottom thereof, said pallet die having a plurality of recesses formed therein with each disposed to receive a different one of said projections therein for self-aligning precision positioning of said pallet die relative to said mold box die; and

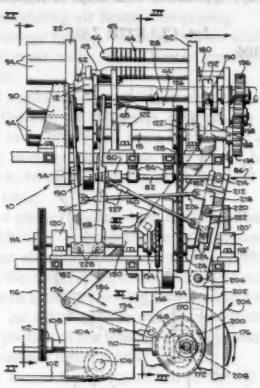
(f) said projections each configured to close approximately one-half of the recess of said pallet die in which it is received so that upon deposition of cement into said mold box die the cementitious block will be formed with the projection depending from each of the corner corbels formed in the bottom horizontal surface thereof.

4,218,207

DOUGH-DIVIDING AND TOROID-FORMING APPARATUS

Daniel T. Thompson, Pacific Palisades, Calif., assignor to Thompson Bagel Machine Manufacturing Corp., Los Angeles, Calif.

Filed Oct. 6, 1978, Ser. No. 949,041
Int. Cl.[2] A21C *5/00, 11/12*
U.S. Cl. 425—241 **6 Claims**



1. Apparatus for automatically forming bagels or the like with a minimum working of the dough comprising:

(a) a first rotary plate member adapted for rotation about a first axis and having a plurality of first cylindrical openings disposed therethrough at equal distances about a common radius from said first axis;

(b) a second rotary plate member adapted for rotation about a second axis parallel to said first axis and having a plurality of second cylindrical openings disposed therethrough at equal distances about a common radius from said second axis, said second rotary plate member being disposed close adjacent and behind said first rotary plate member such that one of said first cylindrical opening and one of said second cylindrical openings can be positioned concentrically;

(c) first indexing means for rotating said first and second plate members between a position where one each of said first and second cylindrical openings are concentrically aligned to a position where the next each in sequence of said first and second cylindrical openings are concentrically aligned;

(d) a plurality of cylindrical forming cups carried by said second rotary plate member concentric with said second cylindrical openings, said forming cups facing away from said first rotary plate member and tapering outward from a first internal diameter at the inlet adjacent the front face of said second rotary plate member to a larger internal diameter adjacent the outlet at the opposite end of said forming cups;

(e) a non-rotary plate member disposed concentrically about said second axis and adapted for longitudinal movement along said second axis between a position close adjacent said second rotary plate member and a position removed from said rotary plate member;

(f) a plurality of cylindrical mandrels carried by said non-rotary plate member facing said first rotary plate member and being disposed to be concentric with said second cylindrical openings and said forming cups with one each of said first and second cylindrical openings concentrically disposed by said first indexing means, the end of the one of said mandrels disposed concentrically with said concentric first and second cylindrical openings being conical;

(g) means for injecting dough into one of said first cylindrical openings and for formin said injected dough into disc-shaped dough lumps as said first rotary plate member is indexed between positions by said first indexing means;

(h) means for forming the center of said disc-shaped dough lumps into a web;

(i) second indexing means operably connected to said first indexing means for operating said web forming means each time said first indexing means has moved said first and second rotary plates on position; and,

(j) third indexing means operably connected to said first indexing means for moving said non-rotary plate member from said removed position to said adjacent position and back again each time said first indexing means has moved said first and second rotary plates one position whereby said mandrels are thrust into said forming cups and removed therefrom to pierce said web of the one of said dough lumps at said conical pointed mandrel position and transfer said latter dough lump from said first rotary plate member to said second rotary plate member and to roll said dough lumps partially down said forming cups at the position of the others of said mandrels thus forming the bagel shape before said dough lumps finally emerge from said outlet end of the one of said forming cups at the position of the final one of said mandrels, said first indexing means being adapted to not index said first and second rotary plate members when said third indexing means has said mandrels inserted into said first and second cylindrical openings.

4,218,208

INPLACE GASKET BELLING MACHINE

Fay A. Hayes, 242 NW. 12th Ave., Boca Raton, Fla. 33432, and Leonard L. Hayes, 1906 -10th Ave., Lewiston, Id. 83501

Filed May 3, 1978, Ser. No. 902,443
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—388 **6 Claims**

1. In an inplace gasket belling machine including a mandrel assembly and means for retractably advancing the mandrel assembly forwardly into one end portion of a plastic pipe, a mandrel assembly comprising:

an outer housing including a stop shoulder adjacent the forward end thereof and a gasket positioning sleeve extended forwardly from said stop shoulder,

an elongated mandrel body portion telescopically received

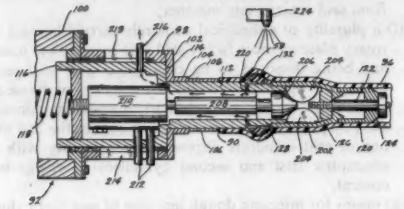
within said outer housing for movement between a forward limit position and a rearward limit position,

said housing having stop means for limiting the relative movement of said mandrel body portion between said forward and rearward limit positions,

bias means urging said body portion toward said forward limit position,

said mandrel body portion including an outwardly and rearwardly flared pipe expanding portion and a gasket carrying portion disposed rearwardly of said flared portion,

said bias means being adapted to provide for the simultaneous insertion of said body portion into said pipe end portion and movement of said body portion to the rearward limit position therefor in response to forward advancement of said outer housing to the extent of engage-



ment of said stop shoulder with the end of said pipe when said pipe expanding portion is engaged with said pipe end portion,

said gasket carrying portion being at least partially telescopically received within said gasket positioning sleeve when the body portion is in the rearward limit position therefor,

said bias means adapted to maintain the stationary disposition of said body portion within said pipe end portion in response to rearward retracting movement of said outer housing to the extent of said body portion attaining the forward limit position therefor, said outer housing and body portion being movable in unison in response to retracting movement of said outer housing when said body portion is in the forward limit position therefor whereby said body portion may be withdrawn from the pipe end portion.

4,218,209

METHOD AND APPARATUS FOR THE THERMAL TREATMENT OF FINE-GRAINED MATERIAL WITH HOT GASES

Horst Herchenbach, Troisdorf, and Hubert Ramesohl, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Wedag AG, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,484

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736579

Int. Cl.² F27B *15/00*; C04B *7/02*

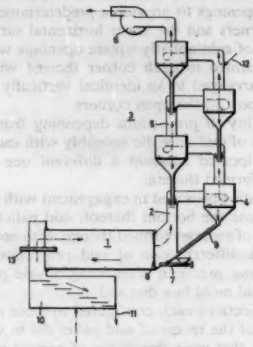
U.S. Cl. 432—14 **2 Claims**

1. In a method of heat treating comminuted raw material in which said material is preheated in a preheater by means of hot exhaust gases from a kiln, separately calcined for the deacidification of a portion of the calcium carbonate present and subsequently burnt to completion in said kiln, the improvement which comprises the steps of:

depositing a bed of said comminuted raw material in said kiln;

supplying coarse pieces of fuel having a grain size in the range of 10 to 40 mm to said kiln to cover said bed of raw material;

utilizing an effective portion of said exhaust gases in said kiln to oxidize said fuel and to generate a temperature sufficient to effect calcination in said bed; and



conducting the separate calcination of said material in said bed in said kiln.

4,218,210

SYSTEM AND METHOD FOR THE HEAT TREATMENT OF FINE GRAINED MATERIALS

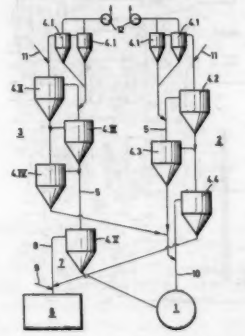
Horst Herchenbach, Troisdorf, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,497

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705566

Int. Cl.² F27B *7/02*

U.S. Cl. 432—106 **4 Claims**



1. A system for the heat treatment of fine grained materials such as pulverized raw material to be used in the manufacture of cement, comprising:

two rows of suspension gas heat exchangers, each row including a plurality of cyclone separators, each said row having a penultimate cyclone separator and the penultimate cyclone separators in each row having their discharge line connected together,

a calcination furnace connected to one side of said rows,

a material cooler connected to the other of said rows,

the row connected to said calcination furnace having at least one cyclone separator less than the row connected to said material cooler, and

a combustion device connected to said material cooler.

4,218,211

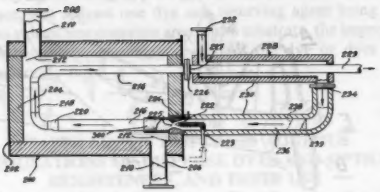
ENERGY RECOVERY SYSTEM

Stanley Z. Caplan, Laval, Canada, assignor to Caplan Energy Recovery Systems Limited, Laval, Canada

Continuation-in-part of Ser. No. 863,720, Dec. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 731,525, Oct. 12, 1976, abandoned. This application Jan. 19, 1979, Ser. No. 5,935

Int. Cl.² F24H *1/00*; F28C *3/10*

U.S. Cl. 432—219 4 Claims



1. An air heater for use in association with a radiant heating tube, the recirculating air heater comprising:

a heat exchanger having a combustion air inlet and a heated combustion air outlet, and a heated gas inlet and a heated gas outlet;

the heated combustion air outlet having a transfer pipe connected thereto, an opposite end of the transfer pipe adapted to be connected to an inlet end of a radiant heating tube, and the heated gas inlet to the heat exchanger adapted to be connected to a discharge end of said radiant heating tube;

the transfer pipe extending from the heated gas outlet of the heat exchanger to an entrance to a radiant heating tube having an air control damper means situated therein;

an end of the transfer pipe adapted to be connected to an entrance to a radiant heating tube having a venturi portion therein, an oil nozzle means being situated within the venturi portion of the transfer pipe adjacent the intake end of said radiant heating tube;

oil supply means being connected to the oil nozzle means; and

igniter means situated adjacent to and downstream of said oil nozzle means within the transfer pipe for igniting a mixture of atomized oil and combustion air, the oil burner high pressure mechanical atomizing nozzle permit fine atomization of the oil within the radiant heating tube;

the venturi portion adapted to facilitate mixing of combustion air and atomized oil, the heated combustion air effecting complete vaporization of the atomized oil, thereby preventing oil drops from contacting walls of the radiant heating tube which would otherwise create carbon deposits resulting in burning out of the radiant heating tube;

the air control damper means providing a control of combustion air in the venturi portion;

a flame adapted to be generated within the radiant heating tube, the flame heating the radiant heating tube to incandescence.

4,218,212

REFRACTORY FRONT WALL FOR INDUSTRIAL FURNACE

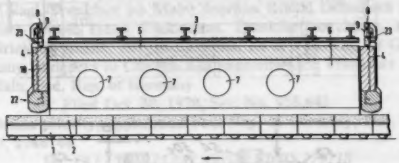
Rudolf Eschenberg, and Herbert Schäfer, both of Dinslaken, Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft Vorm. August Thyssen-Mütte, Duisburg, Fed. Rep. of Germany

Filed Nov. 1, 1978, Ser. No. 956,732

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749590

Int. Cl.² F27D *1/00*, *1/08*

U.S. Cl. 432—247 8 Claims



1. Refractory vertically extending front wall for industrial furnaces, having means at the upper end of the front wall for movable support thereof to permit shifting of the front wall in a direction transverse to the axis of the furnace, comprising:

a plurality of individual intermeshing segments, each of said segments having a tongue and a groove portion, said tongue portion of one of said segments being receivable within said groove portion of a next adjacent segment but being free of connection with said next adjacent segment;

a holding rod for each said individual segment including anchoring means fixed thereto extending into a foot portion of the front wall; and,

said several single segments being movable in relation to one another to provide for ease of interchange by virtue of said tongue and said groove relationship providing a fixed relationship between adjacent ones of said segments to prevent gas from passing between said adjacent segments while being free of a fixed connection therebetween to permit said holding rod together with its said individual segment to be removed and replaced by shifting of said segments in the direction transverse to the axis of said furnace.

4,218,213

THERMALLY CONDUCTIVE PARTITION

Michael A. Csapo, Wyncote, Pa., assignor to Selas Corporation of America, Dresher, Pa.

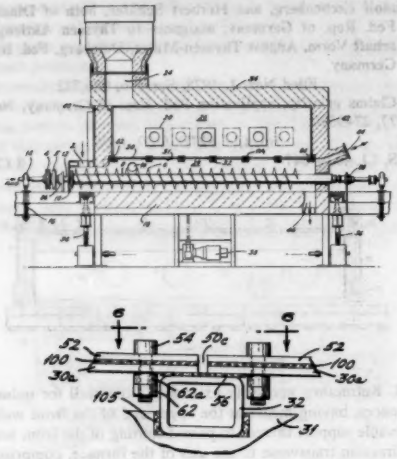
Filed Oct. 16, 1978, Ser. No. 951,389

Int. Cl.² F27D *23/00*

U.S. Cl. 432—249 4 Claims

1. In a heat treatment furnace having a heating zone and a reaction zone which is at least partially heated by radiant heat from the heating zone, the improvement comprising thermally conductive partition means including a plurality of individual muffle panels for separating the reaction and heating zones, said muffle panels being disposed in a plurality of adjacent rows and wherein first expansion spaces are located between said adjacent rows and second expansion spaces are provided between neighboring panels of the same row, said second

expansion spaces being generally perpendicularly related to said first expansion spaces, and a plurality of seal plates, each



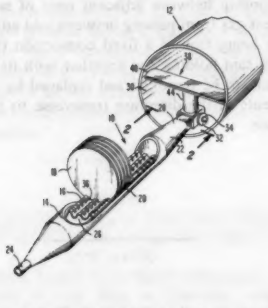
seal plate being superposed over one of said second expansion plates.

4,218,214

GUIDE WING FOR A FURNACE PADDLE

Howard T. Nelson, Findlay, Ohio, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,351
Int. Cl.³ F27D 5/00
U.S. Cl. 432—258 **9 Claims**



1. A furnace paddle having a size and shape that will allow the paddle to traverse a cylindrically-shaped tube of a semiconductor processing furnace, said paddle adapted to hold semiconductor wafers therein and having means attached thereto for supporting the paddle for movement along the inside of said tube, the improvement comprising means attached to said paddle adjacent said supporting means for limiting lateral tracking movement of said supporting means up the inside wall of said tube during longitudinal movement of the paddle within the tube.

4,218,215

AMALGAM CARRIER AND CONDENSER

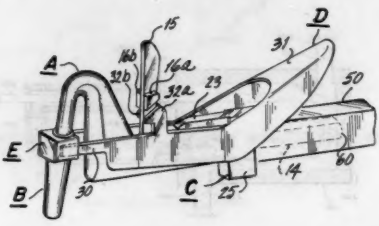
Joseph J. Lancellotti, 8 Starr Rd., East Brunswick, N.J. 08816

Filed Dec. 14, 1978, Ser. No. 969,475
Int. Cl.³ A61C 5/04
U.S. Cl. 433—90 **9 Claims**

1. A dental amalgam carrier, condenser apparatus, comprising:

(a) a rod carrying base member having a front section defining a rod with an arcuate central section coupled to a relatively cylindrical rear section, said base member including a transverse latching member extending therefrom, said transverse latching member comprising a planar member having a projection located on one side thereof, with said projection extending from said side and relatively transverse to said planar member,

(b) a lever member pivotally mounted with respect to said base member, said lever member including a clip mechanism which moves as said lever member is pivoted and positioned to coact with said latching member in a first position to lock said lever member with respect to said base member in said first position, said clip mechanism



having a front section adapted to coact with said projection in said first position to cause said front section to latch upon the surface of said projection,

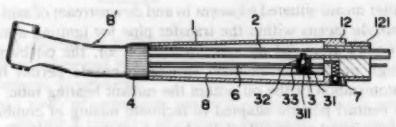
(c) a plunger member coupled to said lever member and having a central aperture, with said rod of said base member located therein, said plunger adapted to move as said lever member moves and to lock when said lever member in said first position to cause said rod to extend from said plunger member defining a condenser position, and to cause said rod to be within said plunger when said lever member is in a second position different than said first to define a carrier position whereby amalgam can be carried by said plunger when said rod is within said plunger and discharged when said plunger is moved to said first position by said lever member.

4,218,216

METHOD OF LUBRICATING DENTAL HAND-PIECE AND SMALL-SIZED OILER FOR USE THEREIN

Hiroshi Sugai, and Haruo Ogawa, both of Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 11, 1978, Ser. No. 923,544
Claims priority, application Japan, Jul. 12, 1977, 52-83751
Int. Cl.² A61C 11/00
U.S. Cl. 433—104 **8 Claims**



1. A small-size oiler in combination with a dental hand-piece including an oil case detachably coupled to said dental hand-piece, an air feed pipe detachably coupled to a rotor driving air passageway of said dental hand-piece, said pipe being loosely inserted into and fixed to said oil case, and an oil check valve coupled to an oil port in said feed pipe, said check valve being automatically opened by the pressure and flow rate of the rotor driving air flowing through said air feed pipe to thereby cause the lubricating oil in the oil case to be continuously mixed into said air and atomized.

4,218,217

METHOD OF PRODUCING MULTICOLOR DYEINGS

Lewis M. Redd, Jr., Douglasville, Ga., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 456,678, Apr. 1, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,798

Int. Cl.[2] D06P 5/12

U.S. Cl. 8—478 54 Claims

1. In a process which comprises applying to a substrate dyeable with an anionic dye (1) a reserving agent which is a colorless organic compound containing a group which is reactive with the available basic groups of the substrate and further containing a sulfonic acid or carboxylic acid group and (2) one or more dyes selected from the group consisting of acid, direct and basic dyes and mixtures thereof and fixing the applied compounds on the material comprising said substrate, the reserving agent being applied to less than the whole of the substrate, and at least one dye and reserving agent being applied to at least one common area of the substrate, the improvement wherein the reserving agent and the dye or dyes are simultaneously fixed.

4,218,218

STABLE FINELY DISPERSED AQUEOUS FORMULATIONS OF DISPERSE DYES AND OPTICAL BRIGHTENERS, AND THEIR USE

Ewald Daubach; Manfred Herrmann; Knut Oppenlaender, all of Ludwigshafen, and Karl Stork, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,347

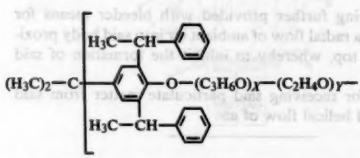
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745449; Nov. 18, 1977, 2751519

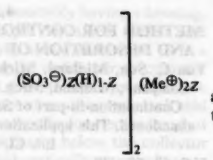
Int. Cl.[2] C09B 29/00; D06P 1/18

U.S. Cl. 8—550 8 Claims

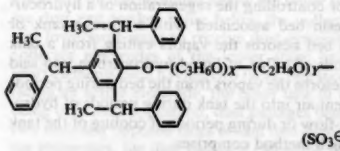
1. A stable finely dispersed aqueous formulation of disperse dyes and optical brighteners, which contains (a) from 5 to 55 percent by weight based on (a+c), of one or more finely divided disperse dyes, optical brighteners or mixtures of these,

(b) from 10 to 200 percent by weight, based on (a), of a water-soluble surfactant of the general formula





or



where X is from 0 to a mean value of 125, Y is from a mean value of 37 to a mean value of 250, but if X is >37, Y:X is at least 1:1, Z is 0 or 1 and Me⊕ is an alkali metal ion, or mixtures of such surfactants,

(c) from 45 to 95 percent by weight, based on (a+c) of water or of a mixture of water and water-retaining agent, and

(d) from 0 to 2.5 percent by weight, based on the formulations, of a disinfectant, pH regulator or mixture thereof.

4,218,219

CONDENSATION PRODUCT FROM PHENOTHIAZINE AND P-NITROSOPHENOL, PROCESS FOR THE PRODUCTION OF THE CONDENSATION PRODUCT, PROCESS FOR THE PRODUCTION OF SULFUR DYESTUFFS USING THE CONDENSATION PRODUCT AND THE SULFUR DYESTUFFS PREPARED THEREWITH

Gert Nagl, Frankfurt am Main; Joachim Ribka, Offenbach am Main-Bürgel; Heinz Dickmanns, Frankfurt am Main, and Ulrich Gotsmann, Bergen-Enkheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 955,643

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748744

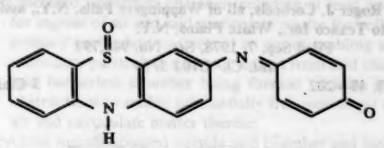
Int. Cl.[2] C09B 21/00, 49/06; C07D 279/18

U.S. Cl. 8—652 10 Claims

1. The process for preparing a condensation product from phenothiazine and p-nitrosophenol in sulfuric acid comprising the steps of

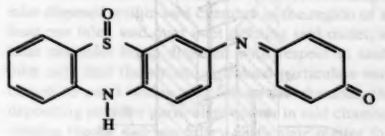
(a) oxidizing phenothiazine with at least 0.5 oxidation equivalents of sulphur trioxide or p-nitrosophenol per mole of phenothiazine in 60 to 100% sulfuric acid and then

(b) condensing the product of step (a) in 60 to 90% sulfuric acid with p-nitrosophenol whereby a condensation product is obtained which contains at least 60% by weight of the indophenol-S-oxide



and/or its tautomers.

8. Process for the production of sulfur dyes wherein a condensation product, which contains at least 60% by weight of the indophenol-S-oxide of the formula



and/or its tautomers or the reduction product thereof, is thionated by the bake or reflux process.

9. The sulfur dyes of the process of claim 8.

4,218,220

METHOD OF FADING BLUE JEANS

Frank R. Kappler, Wyandotte; John J. Cramer, Grosse Ile, and Sarwan K. Kakar, Flat Rock, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 4, 1978, Ser. No. 965,937

Int. Cl.[2] D06L 3/00

U.S. Cl. 8—102 6 Claims

1. Method of producing evenly prefaded, new garments of blue denim, said method comprising the steps of

initially washing said garments with detergent and emulsifier,

bleaching the garments by subjecting them to the simulta-

neous action of bleach and a fabric softener of the quaternary ammonium type, and
further rinsing said garments.

4,218,221

PRODUCTION OF FUELS

Eric C. Cottell, Private Rd., Bayville, N.Y. 11709

Filed Jan. 30, 1978, Ser. No. 873,301
Int. Cl.[2] C10L *1/32*; B01F *11/00*
U.S. Cl. 44—51 **4 Claims**

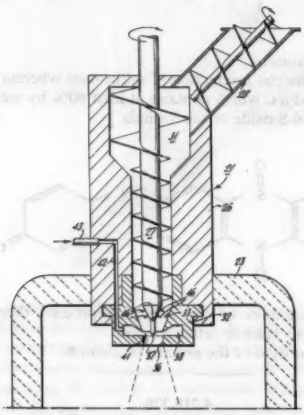
1. A fuel producing process comprising delivering a mixture of oil and water to agitating means effective to produce an emulsion of oil and water, delivering the emulsion to a receptacle from which the emulsion is drawn on demand to an energy producing unit, monitoring the level of emulsion in the receptacle and when the level reaches a predetermined maximum, interrupting the supply of oil and water to the agitating means and wherein said agitating means comprises a chamber having an inlet for a mixture of oil and water, a seat at that inlet, a vibrating element cooperating with said seat, biasing means pressing said vibrating element into engagement with said seat to close said inlet, said process comprising the step of pressurizing the mixture of oil and water, delivering that pressurized mixture to said inlet of said agitating means in opposition of said biasing means to cause said element to vibrate rapidly alternately opening and closing said inlet and to produce a cavitation effect in the mixture passing through the inlet.

4,218,222

METHOD OF CHARGING SOLIDS INTO COAL GASIFICATION REACTOR

John T. Nolan, Jr.; Matthew A. McMahon; Richard V. Kessler, and Roger J. Corbeels, all of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 7, 1978, Ser. No. 940,797
Int. Cl.[2] C10J *3/16*
U.S. Cl. 48—202 **5 Claims**



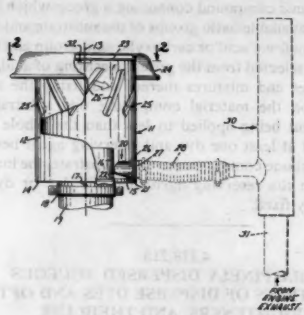
1. In coal gasification employing a high pressure reactor, a method of charging solids into the reactor in a continuous manner, comprising the steps of
feeding said solids in a finely divided form with about 15–40 percent by weight of water through an extruder to form an extrudate capable of withstanding said reactor pressure at the discharge end of said extruder,
stirring said extrudate at said discharge end of said extruder to prevent blocking thereof, and
repulverizing said extrudate upon discharge from said discharge end for reacting to produce a product gas mixture.

4,218,223

PRE-CLEANER FOR COMBUSTION ENGINES

James E. Lidstone, St. Louis Park, and Richard J. Osendorf, St. Paul, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Nov. 25, 1977, Ser. No. 854,515
Int. Cl.[2] B01D *45/16*
U.S. Cl. 55—1 **11 Claims**



1. An engine intake cleaner, for ambient air bearing particulate pollutant matter, comprising a hollow body having a vertical axis and including a cylindrical wall, a solid top closure, and a bottom closure including an axial conduit for conducting air out of said body,
said wall being provided with peripheral inlet means, between said top and said axial conduit, for admitting ambient air into said body in such a way that a principal portion of said air has downward and tangential components of motion, and a minor portion of the air has upward and tangential components of motion, whereby to establish a principal downward helical flow of said air in said body for centrifugal loss of particulate matter by contact with said wall below said inlet means, and to favor the formation of a continuous eddy of said air above said inlet means,
said wall being further provided with bleeder means for admitting a radial flow of ambient air into said body proximate said top, whereby to inhibit the formation of said eddy,
and means for receiving said particulate matter from said downward helical flow of air.

4,218,224

METHOD FOR CONTROLLING THE REGENERATION AND DESORBTION OF AN ABSORBENT MATERIAL

Yun C. Sun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 640,129, Dec. 12, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,134
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—20 **1 Claim**

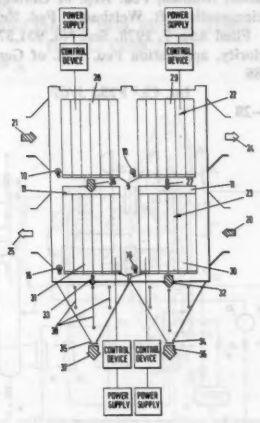
1. A method for controlling the regeneration of a hydrocarbon absorbing resin bed associated with a storage tank or container, which bed adsorbs the vapors exiting from a tank vent during periods of influx of liquid hydrocarbon into said tank and which desorbs the vapors from the bed during periods of influx of ambient air into the tank during periods of hydrocarbon liquid out-flow or during periods of cooling of the tank and contents, which method comprises:
(a) providing a bed of hydrocarbon absorbent resin beads or particles, one end of said bed being in fluid communication with the vent of a hydrocarbon storage tank or container, the other end being in fluid communication with the ambient atmosphere;

(b) providing a source of steam to a valve and from said valve to the ambient atmosphere side of said bed;
(c) providing a thermocouple at each end of said bed, each electrically or pneumatically jointly controlling the valve of said steam source;
(d) calibrating said ambient air side thermocouple to respond to the intake of air from the ambient atmosphere into said bed to activate open the valve of said steam source to heat said air to between about 35° and about 100° C., calibrating said other thermocouple to reduce or shut said valve when the temperature of the air and desorbed vapors from said bed passing said thermocouple into said storage tank reach its predetermined temperature between about 35° and about 100° C.

4,218,225
ELECTROSTATIC PRECIPITATORS

Franz J. Kirchhoff, Olpe, and Joachim Brandt, Wenden, both of Fed. Rep. of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 758,702, Jan. 12, 1977, abandoned, which is a continuation of Ser. No. 579,081, May 19, 1975, abandoned. This application May 2, 1977, Ser. No. 792,515
Claims priority, application Fed. Rep. of Germany, May 20, 1974, 2424432
Int. Cl.[2] B03C *3/47, 3/68, 3/76*
U.S. Cl. 55—112 **3 Claims**

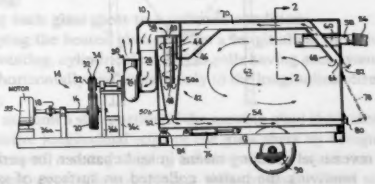


1. In an electrostatic precipitator assembly having a housing, at least two first precipitator stages contained within said housing and arranged vertically one above another to form a first vertically arranged array of upper and lower precipitator stages, said housing having a first gas inlet duct means at one end and a first gas outlet duct means at another end, each said stage including active electrodes and collector electrodes, dust collection pockets mounted immediately below the collector electrodes in said upper stage of said vertically arranged array, a dust exit bunker mounted below the lower stage in said array, the dust exit bunker being below the collector electrodes of said lowermost stage to receive dust precipitated from it, the collector electrodes of the lower stage having two spaced apart elements each having two faces, one face of each element facing an active electrode, the other face of the two elements being in mutual opposition, dust passages being defined by the two mutually opposed faces of said two elements of the collector electrodes, the dust passages extending downwardly from respective dust collection pockets to the dust exit bunker whereby the exit bunker receives in common dust from the upper and lower stages, the improvement comprising at least two additional precipitator stages contained within said housing within which said two first precipitator stages are contained, said two additional precipitator stages being arranged vertically one above another to form a second vertically arranged array of upper and lower precipitator stages, said housing having a second gas inlet duct means and a second gas outlet duct means, said first and second inlet duct means and said first and second outlet duct means are disposed for one horizontal gas flow through each of said upper stages and for another horizontal gas flow through each of said lower stages, separate rapper apparatus for separately rapping the collector electrodes in each stage, and separate power supply means for each said stage.

4,218,226
VACUUM APPARATUS

John D. Boozer, Ocala, Fla., assignor to Link Built Products of Ocala, Inc., Ocala, Fla.

Filed Jul. 25, 1978, Ser. No. 927,805
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—274 **18 Claims**



1. Apparatus for vacuuming particulate matter, comprising:
an enclosed barrierless chamber including at least one inlet for ingress of air and said particulate matter for collecting primary particulate matter and an outlet enabling air and secondary particulate matter to egress from said chamber, said barrierless chamber being formed without internal obstructions to enable substantially free movement of said air and particulate matter therein;
cyclone means mounted outside said chamber and including an intake connected to said outlet for removing said secondary particulate matter;
fan means for generating a partial vacuum within said chamber through said cyclone means; and
duct means for conducting the air and secondary particulate matter from said outlet to said intake, and including a duct inlet disposed within said chamber in the region of said at least one inlet, said duct inlet defining said outlet, said at least one inlet being disposed with respect to said duct inlet such that the air and entrained particulate matter is caused to swirl within said barrierless chamber, thereby depositing primary particulate matter in said chamber and causing the air and secondary particulate matter to enter said duct inlet.

4,218,227
DUST COLLECTOR

Robert E. Frey, Excelsior, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

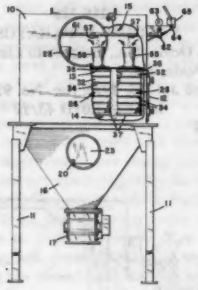
Continuation of Ser. No. 847,255, Oct. 31, 1977, abandoned, which is a continuation of Ser. No. 599,787, Jul. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 486,215, Jul. 5, 1974, abandoned. This application Mar. 12, 1979, Ser. No. 19,787
Int. Cl.[2] B01D *27/06, 27/12*
U.S. Cl. 55—302 **9 Claims**

5. Apparatus for cleaning air at a predetermined rate in terms of volume per unit time, comprising in combination:
means forming a chamber including a sheet having a plurality of apertures therein for admitting air into said chamber;

a like plurality of hollow filter elements each capable of providing a normal filtering function, each comprising a pleated porous paper filter and having a closed end and an open end, and each filter element having a rated velocity for its normal filtering function and a known filter area;

means mounting said filter elements with their open ends communicating with said apertures;

means for exhausting air from said chamber so that said air normally flows radially through said filter elements at said predetermined rate and particulate matter carried by the air collects on surfaces of said elements;



reverse jet cleaning means in said chamber for periodically removing the matter collected on surfaces of said filter elements by directing brief pulses of air at high pressure into said elements at predetermined intervals in a direction opposite to that of the normal air flow; and

means for grossly derating said filter elements so that the particulate matter can be periodically removed during reverse jet cleaning and said pleated paper filters can withstand the stresses placed upon them by the reverse jet cleaning, comprising said plurality of filter elements having a total filter area sufficient to reduce the velocity of air flow through each filter element to a velocity substantially lower than said normal rated velocity.

4,218,228

EXHAUST GAS PURIFYING DEVICE

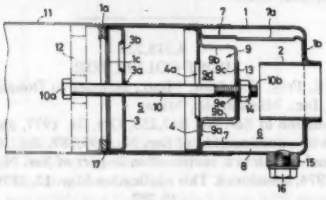
Suguru Hiraoka; Yasuyuki Sakuraya, and Yoshinobu Haneda, all of Tokyo, Japan, assignors to Hoei Industry Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1978, Ser. No. 934,283

Claims priority, application Japan, Apr. 27, 1978, 53-55245[U]

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—319 **5 Claims**



1. An exhaust gas purifying device for an internal combustion engine, comprising:

a main cylindrical member including a front plate having an exhaust gas introducing opening therein for receiving exhaust gas from said engine and a rear plate having an exhaust gas discharging outlet therein for discharging purified exhaust gas, the space defined by the inner surface of said cylindrical member and said front and rear plates comprising an inner chamber,

a partition plate separating said inner chamber into a front chamber between said front plate and said partition plate and a rear chamber between said rear plate and said partition plate said partition plate having a communicating hole which is displaced with respect to said exhaust gas introducing opening,

swirl-generating means disposed in said rear chamber just after the partition plate, and

an inner sleeve member in the rear chamber between said swirl generating means and the inner surface of said cylindrical member so as to form a dual wall construction, said inner sleeve member forming, in conjunction with said inner surface a solid particle collecting chamber and having only one solid particle passing slit disposed at the top of the inner sleeve member.

4,218,229

SEPARATION OF ETHYLENE-CONTAINING HYDROCARBON MIXTURES BY LOW TEMPERATURE RECTIFICATION

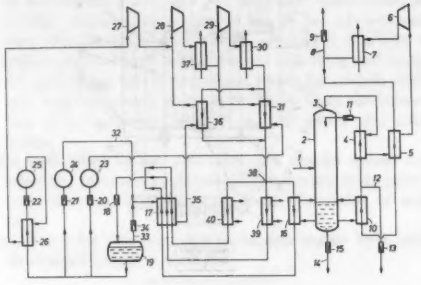
Robert Schuster, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Weisbaden, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,577

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735588

Int. Cl.[2] F25J *3/02*

U.S. Cl. 62—28 **12 Claims**



1. In a low temperature rectification process for the separation of ethylene from a mixture of ethylene and ethane comprising feeding and separating the ethylene-containing mixture in a rectification column into a liquid reboiler fraction enriched in ethane and a gaseous head fraction enriched in ethylene; in a heat pump cycle heating and compressing the head fraction and partially liquefying resultant compressed gaseous head fraction in indirect heat exchange with the reboiler fraction and simultaneously heating said reboiler fraction; expanding and recycling resultant condensed heat fraction, in part, as reflux to the rectification column; and withdrawing, in part, resultant condensed fraction as product ethylene, the improvement which comprises heating the liquid reboiler fraction, in part, in indirect heat exchange with a closed refrigeration cycle, whereby said reboiler fraction is simultaneously heated by a combination of said heat pump cycle and said closed refrigeration cycle, said closed refrigeration comprising a compressor, a condenser in heat exchange with the reboiler fraction to condense the refrigerant, an expander for the condensate, and means to pass the expanded condensate in heat exchange with the condensate before ecpansion.

4,218,230

METHOD OF GLASS STRENGTHENING BY ION EXCHANGE

Patrick M. Hogan, DuBois, Pa., assignor to Brockway Glass Company, Inc., Brockway, Pa.

Filed Aug. 4, 1978, Ser. No. 930,938
Int. Cl.[2] C03C *17/22, 21/00*
U.S. Cl. 65—30 E 5 Claims

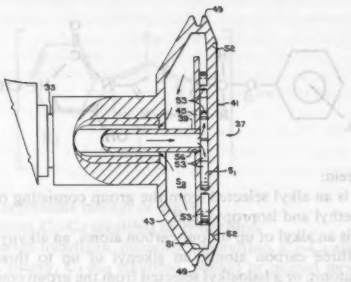
1. A single stage method of strengthening soda-lime-silicate glass articles by substituting potassium ions for sodium ions in the surface layer of the glass to produce a compressive layer, said method comprising spraying an aqueous exchange solution consisting essentially of at least 5% by weight potassium ions, from about 1 to about 6 weight percent of sodium ions and water to form a coating upon the glass at a temperature from about 200° C. to just below the annealing point of the glass, maintaining said glass at a temperature below the annealing point for a time sufficient to cause ion exchange to occur, and cooling to room temperature, whereby sodium ions are evenly and quickly replaced by potassium ions beneath the surface of the glass with reduced pitting or etching of the glass surface.

4,218,231

COOLING OF EDGE STRETCHING ROLLERS FOR USE IN MAKING FLAT GLASS

Robert G. Lemmon, Jr., Houston, and Melvin F. Earnest, Wichita Falls, both of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 15, 1979, Ser. No. 12,672
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A 10 Claims



1. In an edge roll for engaging a surface of glass as the glass is advanced along the surface of molten metal to form it into a continuous, dimensionally stable sheet of flat glass wherein the roll is hollow and is mounted on a shaft which provides for its rotation and for axial, angular and longitudinal movement of the roll and provides a conduit for feeding a fluid coolant medium through the hollow interior of the roll and wherein the roll is provided with a plurality of projections about its periphery for engaging glass, the improvement which comprises

an internal fluid coolant distributor plate connected to a face plate of the roll separating the hollow interior of the roll into two spaces, a first one adjacent a hot face of the roll and a second one adjacent a back face of the roll joined to the shaft with communication provided between the two spaces in a region extending substantially about the interior periphery of said roll; and wherein said distributor plate is provided with a plurality of curved vanes adapted to direct said fluid coolant radially toward the interior of the peripheral surface of said roll.

7. A method of cooling an edge roll adapted to engage a surface of glass comprising directing coolant fluid against a central portion of the hot face of said roll and then radially outward along said hot face in a plurality of radially extending separate arcuate paths having an arcuate component that releases said coolant tangentially against the inner surface of the periphery of said roll.

4,218,232

METHOD OF SHAPING MOVING SHEETS ON ROLL FORMING APPARATUS

Richard E. Wilhelm, Galion, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 18, 1979, Ser. No. 4,432
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 3 Claims

1. A method of shaping a series of discrete glass sheets comprising:

heating each glass sheet to a softened condition;

conveying the heated glass sheet in a longitudinal direction on rotating, cylindrical conveyor rolls having axes extending horizontally and transversely to the longitudinal direction;

lifting as a unit a side portion of the moving glass sheet along an entire longitudinal edge of the glass sheet by bringing contoured, rotating shaping rolls between at least some of the conveyor rolls into contact with the underside of said side portion, so as to raise said side portion above the level of support of the conveyor rolls; and

as the glass sheet continues to be conveyed in the longitudinal direction, maintaining the glass sheet in contact with a sequence of raised shaping rolls for a sufficient time to cause the glass sheet to sag into conformity with the contour of the shaping rolls solely by force of gravity.

4,218,233

METHOD FOR DEODORIZING POULTRY HOUSES

William C. Hackett, London, Ohio, assignor to G. D. Searle & Co., Skokie, Ill.

Filed Aug. 9, 1976, Ser. No. 712,613
Int. Cl.[3] C05F *11/08*
U.S. Cl. 71—9 4 Claims

1. A method for reducing offensive odors in poultry houses comprising adding at least 0.5% by weight of finely divided cow manure which has been composted by thermophilic aerobic bacteria to poultry excreta.

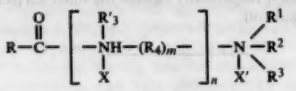
4,218,234

SOIL CONDITIONERS

Miklós Nadasy; Miklós Kovács; Márton Kólcsei; János Vad; Béla Bartha; Ottó Dobozy; Ferenc Máté, and Éva Karácsonyi née Spindler, all of Budapest, Hungary, assignors to Novex Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 790,247, Mar. 25, 1977, abandoned, which is a continuation of Ser. No. 422,888, Dec. 1, 1973, abandoned. This application Sep. 1, 1977, Ser. No. 829,740
Claims priority, application Hungary, Dec. 7, 1972, EE 2074
Int. Cl.[2] A01N *5/00, 7/00*
U.S. Cl. 71—86 3 Claims

1. A method for increasing plant yield comprising applying to the soil in which the plants are to be grown, an amount effective to increase the yield of said plants of a cationactive compound of the formula I



(I),

wherein R is a C_{10-24} linear or branched alkyl, alkenyl or alk-dienyl-group; R_1 is hydrogen, R_2 is hydrogen, C_{2-18} is a linear or branched alkyl, alkenyl, alk-dienyl or C_{2-18}-alpha-keto-group, R_3 is a hydrogen; R_3' if present is hydrogen or C_{1-8} alkyl; X and X' are formiate, acetate, propionate, hydrophosphate, hydroxyl, halogen or nitrate; R_4 methylene, ethylene or a polyglycolether-group; m is a cardinal number from 1–6 and n is an integer from 1–6; and a chemically compatible solvent, dispersing agent or carrier therefore.

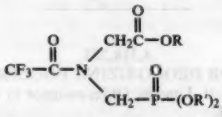
4,218,235

ESTER DERIVATIVES OF N-TRIFLUOROACETYL-N-PHOSPHONOMETHYLGLYCINE AND THE HERBICIDAL USE THEREOF

John E. Franz, Crestwood, and Robert J. Kaufman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

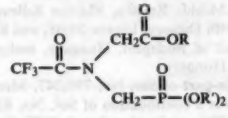
Filed Jul. 10, 1978, Ser. No. 922,920
Int. Cl.² A01N 9/36; C07F 9/02
U.S. Cl. 71—86 **21 Claims**

1. A compound of the formula



wherein R is an alkyl group containing from 1 to 10 carbon atoms or a phenyl group and R' is a member of the group consisting of allyl, naphthyl, benzyl and ring-substituted benzyl wherein the substituent is halo, cyano, nitro or trifluoromethyl, phenyl and phenyl containing one or two groups selected from the class consisting of halo, cyano, nitro and trifluoromethyl.

15. A herbicidal method which comprises contacting the plant or plant growth medium with a herbicidally effective amount of a compound of the formula



wherein R is an alkyl group containing from 1 to 10 carbon atoms or a phenyl group and R' is a member of the group consisting of allyl, naphthyl, benzyl and ring-substituted benzyl wherein the substituent is halo, cyano, nitro or trifluoromethyl, phenyl and phenyl containing one or two groups selected from the class consisting of halo, cyano, nitro and trifluoromethyl.

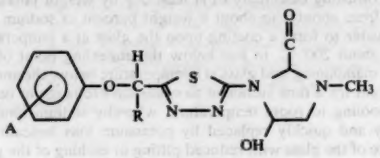
4,218,236

3-[5-[1-(2-, 3-, OR 4-METHYL, OR ETHYL OR ISOPROPYLPHENOXY) ALKYL, ALKYNYL, HALOALKYL]-1,3,4-THIADIAZOL-2-YL]-4-HYDROXY-1-METHYL METHYL-2-IMIDAZOLIDINONES

Jerome M. Lavanish, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 18, 1979, Ser. No. 50,025
Int. Cl.² A01N 9/22; C07D 417/04
U.S. Cl. 71—90 **30 Claims**

1. A compound graphically represented by Formula I

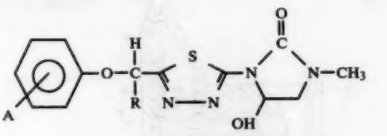


wherein:

A is an alkyl selected from the group consisting of methyl, ethyl, and isopropyl and,

R is an alkyl of up to four carbon atoms,
an alkenyl of up to three carbon atoms,
an alkynyl of up to three carbon atoms, or
a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl and 2-bromoethyl.

16. A method of controlling weeds, which comprises contacting the weeds with a herbicidally effective amount of a compound graphically represented by Formula I:



(I)

wherein:

A is an alkyl selected from the group consisting of methyl, ethyl and isopropyl, and,

R is an alkyl of up to four carbon atoms, an alkynyl of up to three carbon atoms, an alkenyl of up to three carbon atoms, or a haloalkyl selected from the group consisting of chloromethyl, bromomethyl, 2-chloroethyl and 2-bromoethyl.

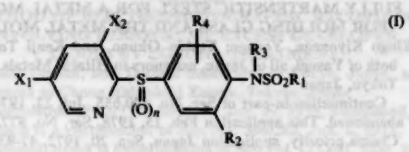
4,218,237

PYRIDINE-2-THIO, -2-SULFINYL, AND -2-SULFONYL SULFONANILIDE COMPOUNDS USEFUL AS A HERBICIDAL COMPONENT

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Kusatsu; Fumio Kimura, Kusatsu; Rikuo Nasu, Kusatsu; Nobuyuki Sakashita, Kusatsu, and Shigeyuki Nishimura, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Limited, Osaka, Japan

Filed Nov. 17, 1978, Ser. No. 961,518
Claims priority, application Japan, Nov. 29, 1977, 52-143084; Mar. 29, 1978, 53-36348
Int. Cl.² C07D 213/70; A01N 9/22
U.S. Cl. 71—94 **37 Claims**

1. A sulfonanilide compound having the formula (I):



wherein X_1 is hydrogen atom, a halogen atom, methyl group or trifluoromethyl group, X_2 is hydrogen atom or a halogen atom, R_1 is a (C_1–C_4) alkyl group or a halo (C_1–C_4) alkyl group, R_2 is hydrogen atom, a (C_1–C_4) alkyl group, trifluoromethyl group or nitro group, R_3 is hydrogen atom, $-SO_2R_1$ group (R_1 is the same as defined above), a (C_2–C_4) acyl group, a (C_2–C_4) acylmethyl group, a (C_1–C_4) alkyl group, a (C_1–C_4) alkoxy (C_1–C_4) alkyl group or a (C_3–C_4) alkenyl group, R_4 is hydrogen atom or a halogen atom and n is an integer of 0 to 2; and a salt thereof.

4,218,238

HERBICIDAL 1-ALKYL-3-PHENYLPYRIDINIUM SALTS

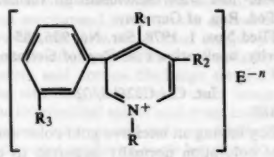
Harold M. Taylor, Indianapolis, and Robert G. Suhr, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 917,038, Jun. 19, 1978, Pat. No. 4,174,209. This application Jun. 20, 1979, Ser. No. 50,891

Int. Cl.[2] A01N *9/22;* **C07D** *213/28*

U.S. Cl. 71—94 **23 Claims**

1. A compound of the formula



wherein R represents methyl or ethyl;

R_1 represents C_1–C_4 alkylthio or benzylthio;

R_2 represents hydrogen, phenoxy, phenylthio, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, phenyl or phenyl monosubstituted with chloro, bromo, fluoro, trifluoromethyl, C_1–C_3 alkyl or C_1–C_3 alkoxy;

R_3 represents C_1–C_3 alkyl, C_1–C_3 alkoxy, trifluoromethyl, chloro, fluoro or bromo;

E represents an anion capable of forming a pyridinium salt; and

n represents an integer of 1 to 3.

15. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with a herbicidally-effective amount of a compound of claim 1.

4,218,239

HERBICIDAL ESTERS OF N-ALKYLPROPANAMIDES

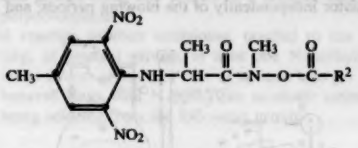
Ian D. Entwistle, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 910,404, Jun. 19, 1978, Pat. No. 4,166,734, and a continuation-in-part of Ser. No. 855,104, Nov. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 826,214, Aug. 19, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,337

Int. Cl.[2] C07C *63/04, 83/10;* **A01N** *9/20, 9/21*

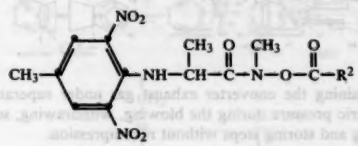
U.S. Cl. 71—115 **7 Claims**

1. The racemic or the (d) form of a compound of the formula



wherein R^2 is a methyl or chloromethyl group.

2. The racemic or the (d) form of a compound of the formula



wherein R^2 is a cyclopropyl, 1-methylcyclopropyl or cyclopropylethyl group.

4,218,240

METHOD FOR PRODUCING COBALTIC HEXAMMINE COMPOUNDS AND COBALT METAL POWDER

Richard G. W. Gingerich, Towanda, and Robert P. McClintic, Monroeton, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 14, 1979, Ser. No. 38,970

Int. Cl.[2] C22B *23/04*

U.S. Cl. 75—0.5 AA **14 Claims**

1. A method for recovering a cobaltic hexammine halide from an aqueous solution containing cobalt ions and ion impurities comprising complexing said cobalt ions with ammonia in the presence of a catalyst to form cobaltic hexammine ions, treating said solution with an acid in the presence of halide ions to form a cobaltic hexammine halide precipitate, and removing said precipitate from said solution and ion impurities.

4,218,241

METHOD OF RECOVERING ENERGY FROM CONVERTER EXHAUST GASES

Karl-Rudolf Hegemann, Essen-Bergerhausen, and Helmut Weissert, Bochum-Hiltrop, both of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrückkühlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 929,954

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734961

Int. Cl.[2] C21C *5/38;* **C21B** *3/04*

U.S. Cl. 75—60 **8 Claims**

1. A method of recovering energy from a converter exhaust gas in the refining of steel, comprising the steps of

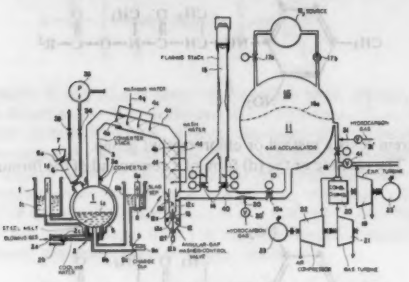
blowing melts of steel in a converter while hermetically closing same to enable the build-up of a superatmospheric pressure in said converter;

withdrawing converter exhaust gas at a superatmospheric pressure from said converter;

scrubbing the withdrawn converter exhaust gas with water in an annular-gap washer having a control member for varying the pressure differential across a scrubbing gap and thereby controlling the pressure in said converter;

storing the scrubbed converter exhaust gas for subsequent use in refining operations in a gas accumulator;

feeding a gas consumer with the exhaust gas from said accumulator independently of the blowing periods; and



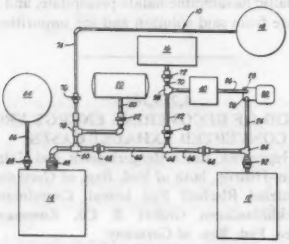
maintaining the converter exhaust gas under superatmospheric pressure during the blowing, withdrawing, scrubbing and storing steps without recompression.

4,218,242

SILVER RECOVERY METHOD

John E. LeGrange, 3300 Lightner La., Oklahoma City, Okla. 73179

Filed Jan. 2, 1979, Ser. No. 251
Int. Cl.[2] C22B *11/04*
U.S. Cl. 75—101 R **15 Claims**



1. A process for the separation of silver from source material comprising the steps of

(1) reacting the source material with a solution containing nitric acid to form a reaction mixture having a substantially acidic liquid phase containing dissolved silver(I) nitrate;

(2) separating the liquid phase from the remainder of the reaction mixture;

(3) gradually adding to the liquid phase of the reaction mixture increments of a solution of an alkali metal cyanide to form silver(I) cyanide precipitate;

(4) discontinuing addition of the cyanide solution when silver(I) cyanide precipitate ceases to form after an increment of cyanide solution is added; and

(5) separating the silver(I) cyanide precipitate from the remainder of the liquid phase of the reaction mixture.

4,218,243

FULLY MARTENSITIC STEEL FOR A METAL MOLD FOR MOLDING GLASS AND THE METAL MOLD

Kingo Kiyonaga, Yonago; Toshio Okuno, and Kenji Tokuda, both of Yasugi, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 490,655, Jul. 22, 1974, abandoned. This application Feb. 15, 1978, Ser. No. 877,807
Claims priority, application Japan, Sep. 20, 1972, 47-93589
Int. Cl.[2] C22C *39/14*
U.S. Cl. 75—124 **4 Claims**

1. A steel for metal mold for molding glass which consists of 0.25–0.65% of C, up to 2.50% of Si, up to 2.00% of Mn, 10.00–20.00% of Cr, 4.00–13.00% of Co, 1.00–3.00% of Al, up to 0.25% of N and the balance essentially Fe and ordinary impurities and satisfies the relation:

$$\text{Cr equivalent} = -40C(\%) + -6Si(\%) - 2Mn(\%) + Cr(\%) - 2Co(\%) - 30N(\%) + -12Al(\%) \leq 13\%$$

and which has a single phase of martensite by a heat treatment for hardening and tempering and has a standard hardness of H_B 229–293 after said heat treatment.

4,218,244

GOLD ALLOY FOR FIRING ON PORCELAIN FOR DENTAL PURPOSES

Helmut Knosp, Pforzheim, Fed. Rep. of Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Nov. 1, 1978, Ser. No. 956,985
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751547
Int. Cl.[2] C22C *5/02*
U.S. Cl. 75—165 **9 Claims**

1. A gold alloy having an intensive gold color and free from the gray-white coloration normally imparted to gold alloys containing palladium suitable for having porcelain fired thereon consisting of 80 to 90% gold, 5 to 15% platinum, 0.5 to 10% palladium, 0.1 to 3% indium, 0 to 3% tin and at least one member selected from the group consisting of 0.5 to 3% rhodium, 0.1 to 2% tantalum and 0.1 to 2% of tungsten.

4,218,245

NICKEL-BASE ALLOY

Margarita I. Batova, ulitsa Stroitelei, 7, korpus 1, kv. 66; Igor V. Meschaninov, ulitsa Petrozavodskaya, 5, korpus 2, kv. 353; Sergei G. Khajutin, B. Pirogovskaya ulitsa, 37-43, korpus B, kv. 52; Sergei L. Shapiro, Ryazansky prospekt, 67/2, kv. 106, and Efim S. Shpichinetsky, Donskaya ulitsa, 6, kv. 93, all of Moscow, U.S.S.R.

Filed May 26, 1978, Ser. No. 909,989
Int. Cl.[2] C22C *19/03*
U.S. Cl. 75—170 **1 Claim**

1. A nickel-base alloy consisting essentially of 0.05 to 6.5 percent by weight of manganese, 0.01 to 6.0 percent by weight of copper, 0.01 to 5.0 percent by weight of at least one of the elements selected from the group consisting of titanium, vanadium, molybdenum, chromium, tungsten, niobium, and tantalum, nickel being the balance, said alloy having a magnetostriction which reaches 50×10^{-6} after annealing effected at a temperature of 700° to 1200° C. and a yield strength $\epsilon 0.2$ of 6.5 to 20 kg per sq. mm.

4,218,246

METHOD OF ELECTROPHOTOGRAPHIC RECORDING INVOLVING REMOVAL OF EXCESS DEVELOPER LIQUID BY CORONA TREATMENT

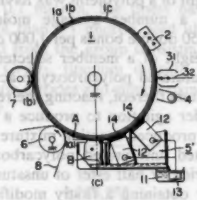
Hiroshi Tanaka, and Takashi Saito, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 650,044, Jan. 19, 1976, abandoned, which is a continuation of Ser. No. 366,262, Jun. 4, 1973, abandoned, which is a continuation of Ser. No. 122,861, Mar. 10, 1971, abandoned. This application Jan. 19, 1978, Ser. No. 870,714

Claims priority, application Japan, Mar. 18, 1970, 45-22822

Int. Cl.² G03G *13/10*

U.S. Cl. 430—126 **4 Claims**



1. An electrophotographic recording method utilizing a rotatable drum, formed with a photoconductive layer, on which drum a latent electrophotographic image may be formed, developed with toner and thereafter transferred to a transfer material, comprising the steps of forming a latent electrophotographic image on said drum; then applying liquid developer onto said drum to form a toner image of said latent electrophotographic image, said liquid developer comprising a carrier liquid having toner dispersed therein; thereafter removing, without mechanical intervention, excess liquid from said drum to prevent the flow of the toner image by subjecting said drum to corona discharge of the same polarity as that of the toner, wherein said corona discharge simultaneously acts to increase the attaching force of said toner image to said drum, wherein the longitudinal axis of said drum extends in a horizontal direction and wherein said corona is applied to said drum at a position disposed within an angle less than 60 degrees from a vertical line extending downwardly from the longitudinal axis of said drum and measured in the direction of drum rotation; and thereafter transferring the toner image to transfer material.

4,218,247

PHOTOCONDUCTIVE RESIN CONTAINING TERTIARY AMINO GROUPS FOR ELECTROPHOTOGRAPHY

Shigeyoshi Hara, and Iwao Omae, both of Hino, Japan, assignors to Teijin Limited, Osaca, Japan

Continuation of Ser. No. 660,980, Feb. 24, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,577

Claims priority, application Japan, Feb. 28, 1975, 50-24063; May 20, 1975, 50-59199

Int. Cl.² G03G *5/04*

U.S. Cl. 430—78 **11 Claims**

1. An electrophotographic sensitive layer which comprises:

(1) at least one solvent-soluble aromatic amino-containing photoconductive resin as a photoconductive base;

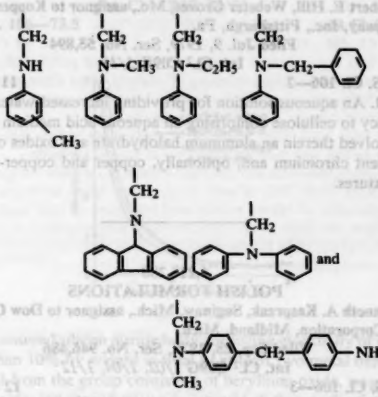
(2) at least one sensitizer selected from the group consisting of optical sensitizers and chemical sensitizers; and

(3) at least one solvent-soluble binder polymer having compatibility with said solvent-soluble aromatic amino-containing photoconductive resin (1);

said solvent-soluble aromatic amino-containing photoconductive resin (1) being a reaction product of (i) a soluble low-molecular-weight polycondensate comprising a xylene/formaldehyde resin or a resol-type phenolic resin with (ii) an aromatic amino compound,

said polycondensate having a molecular weight of 200 to 3,000 and having dimethylol ether groups, methylol groups and/or functional groups thereof, the content of said groups being one per 0.1 to 3 benzene rings of said polycondensate,

said reaction product containing, bonded to the benzene ring, as pendant groups, at least one N-methylene aromatic amino group at a rate of at least one per 0.5 to 7 benzene rings, said N-methylene aromatic amino group being selected from the following group:



4,218,248

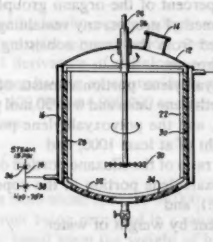
PROCESS FOR THE MANUFACTURE OF METAL JOINING PASTE

John L. Snyder, Cleveland, Ohio, and Paul D. Johnson, Merrillville, Ind., assignors to SCM Corporation, New York, N.Y.

Filed Apr. 21, 1978, Ser. No. 897,931

Int. Cl.² C09D *5/10*

U.S. Cl. 106—1.12 **15 Claims**



1. A process for making metal joining paste suitable for fine bore dispensing containing a vehicle and metal powder suitable for joining, said process comprising:

preparing said vehicle by mixing together the vehicle ingredients including an organic solvent and a fluxing amount of a normally solid joining paste flux at an elevated temperature sufficient to render the flux substantially soluble in said solvent;

cooling said vehicle under shock cooling conditions at an average rate of at least about 3° F. per minute that produce a sufficiently uniform distribution of fine precipitate particles of said flux necessary for such fine bore dispensing;

blending a joining amount of said metal powder with said vehicle, said blending taking place without significant exposure of the powder metal to the vehicle at elevated temperature; and

collecting the resulting product paste at a temperature suffi-

ciently low to be inhibitive of significant reaction of the metal powder with vehicle.

4,218,249

WATER-REPELLENT AQUEOUS WOOD-TREATING SOLUTIONS

Robert E. Hill, Webster Groves, Mo., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 9, 1979, Ser. No. 55,894
Int. Cl.[2] C09K *3/18*
U.S. Cl. 106—2 **11 Claims**

1. An aqueous solution for providing increased water repellency to cellulose comprising an aqueous acid medium having disolved therein an aluminum halohydrate and oxides of hexavalent chromium and, optionally, copper and copper-arsenic mixtures.

4,218,250

POLISH FORMULATIONS

Kenneth A. Kasprzak, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 28, 1978, Ser. No. 946,486
Int. Cl.[2] C09G *1/02, 1/04, 1/12*
U.S. Cl. 106—3 **12 Claims**

1. In a water-in-oil polish formulation containing as components thereof a wax and/or an abrasive and optionally at least one member selected from the group consisting of solvents, surfactants thickening agents, detergent resistant additives, colorants, odorants, and other ingredients normally used in making polishes, the improvement which consists of incorporating into the polish formulation, based on the total weight of the polish formulations,

(a) 5 to 60 percent by weight of a cyclodoimethylsiloxane fluid,

(b) 0.5 to 10 percent by weight of a polydiorganosiloxanepolyoxyalkylene copolymer in which copolymer

(i) at least 95 percent of the organo groups in the siloxane portion are methyl groups, any remaining organo groups being selected from the group consisting of ethyl, vinyl, and phenyl groups,

(ii) the polyoxyalkylene portion consists of 50 to 100 mol percent oxyethylene units and 0 to 50 mol percent oxypropylene units, and the polyoxyalkylene portion has a molecular weight of at least 1000, and

(iii) the weight ratio of the siloxane portion of the copolymer to the polyoxalkylene portion of the copolymer is in the range of 2–8:1, and

(c) 30 to 95 percent by weight of water.

4,218,251

DRIOGRAPHIC INK

James F. Sanders, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 24, 1978, Ser. No. 936,376
Int. Cl.[2] C09D *11/02, 11/06, 11/08, 11/10*
U.S. Cl. 106—30 **6 Claims**

1. A printing ink capable for use in driography comprising: (a) a varnish comprising at least one polymer having a weight average molecular weight of at least about 25,000 and a solvent therefor; and (b) at least about 5.0 percent by weight, based on said varnish, of at least one non-reinforcing filler, said filler having an acicular or platy shape; (c) a silicone fluid incompatible with said varnish and having a viscosity of from about 20 centipoise to about 1,000 centipoise and a concentration of from about 0.25 to about 5.0 percent by weight of said varnish.

4,218,252

INK COMPOSITIONS FOR CARBON PAPER

Nobuo Yokoyama, Yokohama, Japan, assignor to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Jun. 27, 1978, Ser. No. 919,638
Claims priority, application Japan, Feb. 3, 1978, 53-10555
The portion of the term of this patent subsequent to Apr. 8, 1995, has been disclaimed.
Int. Cl.[2] C09D *11/00, 11/12*
U.S. Cl. 106—31 **8 Claims**

1. An ink composition for carbon paper comprising a base oil, wax, carbon black, a dyestuff and filler, characterized by the fact that the wax contains at least 5% by weight, based on the weight of the wax, of a final wax prepared by incorporating 100 parts by weight of a polyolefin wax having a melting point of 70°–120° C., a number average molecular weight of 400–1,500 and 5–50 double bonds per 1,000 carbon atoms with 3–25 parts of weight of a member selected from the group consisting of unsaturated polycarboxylic acids and the anhydrides and half esters thereof, reacting the resulting mixture at 200°–280° C. under agitation to produce a reaction mixture, treating the thus produced reaction mixture to remove therefrom the unreacted unsaturated polycarboxylic acid or the unreacted anhydride or half ester of unsaturated polycarboxylic acid thereby obtaining a firstly modified wax and then converting 20–100% of the acidic groups contained in the thus obtained firstly modified wax to a salt of a metal of Group II of the Periodic Table thereby obtaining the final wax.

4,218,253

SINTERED CERAMIC MATERIAL OF IMPROVED DUCTILITY

Ulf Dworak, Hohengehren, and Hans Olapinski, Plochingen, both of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Viersen, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,744
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744700
Int. Cl.[2] C04B *35/48, 35/10, 35/56*
U.S. Cl. 106—43 **7 Claims**

1. A densely sintered material consisting essentially of a matrix and individual particles of at least one oxide of the group consisting of zirconium oxide and hafnium oxide, said individual particles being uniformly distributed in said matrix and being present in said material in an amount of one to fifty percent by volume, said oxide being predominantly in the tetragonal crystal form, and the average size of said individual particles being between 0.05 and 2 μm, said matrix consisting essentially of at least one member of the group consisting of silicon carbide, titanium carbide, niobium carbide, tungsten carbide, silicon nitride, titanium nitride, and aluminum oxide.

4,218,254

REFRACTORY COMPOSITIONS SUITABLE FOR PREPARING LOW WATER-CONTENT INJECTABLE PASTES

Jean-Pierre Kiehl, Lyons, and Bernard A. Clavaud, Saint Pierre de Chandieu, both of France, assignors to Societe Europeenne des Produits Refractaires, Neuilly-sur-Seine, France

Filed Mar. 8, 1979, Ser. No. 18,770
Claims priority, application France, Mar. 21, 1978, 78 08143
Int. Cl.[2] C04B *35/52*
U.S. Cl. 106—44 **9 Claims**

1. Refractory compositions suitable for preparing injectable pastes, which comprise the following essential constituents:

(1) 30 to 60% by weight of a coarse fraction comprised of grains at least 50% of which have a particle size greater than 0.5 mm, the greatest grains being not greater in size than 10 mm, said course fraction being comprised of natural or synthetic inorganic materials which are inert to water;

(2) 10 to 30% by weight of a fine fraction comprised of particles at least 50% of which have a particle size smaller than 75 microns, the finest particles being not smaller in size than 10 micron, said fine fraction being comprised of natural or synthetic inorganic materials which are inert to water;

(3) 10 to 30% by weight of a very fine fraction comprised of particles at least 50% of which have a particle size smaller than 5 microns, the finest particles being not smaller in size than 0.1 micron, said very fine fraction being comprised of natural or synthetic inorganic materials which are inert to water; and

(4) 10 to 30% by weight of an ultra fine fraction comprised of particles at least 80% of which have a particle size smaller than 0.1 micron, the finest particles being not smaller in size than 0.1 micron, said ultra fine particles being selected from the group consisting of silica, chromium oxide Cr_2O_3, titanium dioxide, zirconia, silicon carbides, silicon nitrides and silicon oxinitrides which are inert to water.

4,218,255

POROUS CERAMIC CARRIERS FOR CONTROLLED RELEASE OF PROTEINS, POLYPEPTIDE HORMONES, AND OTHER SUBSTANCES WITHIN HUMAN AND/OR OTHER MAMILLIAN SPECIES AND METHOD

Praphulla K. Bajpai, and George A. Graves, both of Dayton, Ohio, assignors to University of Dayton, Dayton, Ohio

Continuation-in-part of Ser. No. 718,957, Aug. 30, 1976, abandoned. This application Sep. 12, 1978, Ser. No. 941,594

Int. Cl.[2] A61M *7/00*; C04B *33/24, 35/44*

U.S. Cl. 106—45 **8 Claims**

1. The process of forming an in-vivo implant which is a porous, resorbable ceramic material having interconnected pores and suitable for the prolonged release of a pharmaceutical comprising:

powdering and mixing together oxides comprising by weight about 38% CaO, 50% Al_2O_3 and 12% P_2O_5, and with impurities less than 1%, and compressing said mixture,

calcining said mixture at approximately 2400° F. for 12 hours to yield a crystallographic structured ceramic of at least two phases,

powdering said calcined mixture and sieving the same through screens of two different mesh sizes to obtain particles ranging from a size that passes through 200 mesh (−200) and is retained on 400 mesh (+400),

mixing with a binder and thereafter compressing said powdered mixture at a pressure of about 20,000 psi, and then,

sintering said mixture for a time and temperature related to the average particle size.

4,218,256

METHOD OF FORMING SLIDE GATE VALVE PARTS

Ralph B. Videtto, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 6, 1979, Ser. No. 18,075

Int. Cl.[2] C04B *35/04*

U.S. Cl. 106—58 **10 Claims**

1. Method of forming a slide gate valve part by casting an admixture of water and a castable refractory into a form wherein the castable refractory consists essentially of (a) from 1 to 5% of a long chain glassy polyphosphate and (b) from 0.1 to 0.5% boric acid, the balance of the castable refractory being sized periclase refractory grain, all percentages being by weight based on the total weight of grain, polyphosphate, and boric acid.

4,218,257

SINTERED SILICON NITRIDE BODY AND A METHOD OF PRODUCING THE SAME

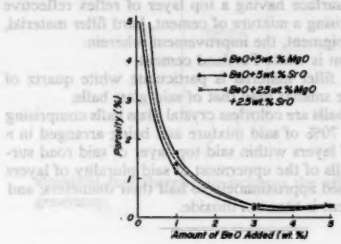
Isao Oda, Nagoya, and Masayuki Kaneno, Tokoname, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Division of Ser. No. 672,928, Apr. 2, 1976, Pat. No. 4,134,947. This application Aug. 14, 1978, Ser. No. 933,403

Claims priority, application Japan, Apr. 7, 1975, 50-41164; Apr. 18, 1975, 50-46518

Int. Cl.[2] C04B *35/58*

U.S. Cl. 106—73.5 **14 Claims**



1. A sintered silicon nitride body consisting essentially of not more than 10% by weight in total of at least two metal oxides selected from the group consisting of beryllium oxide, magnesium oxide and strontium oxide, provided that each of said metal oxides is not more than 5% by weight, and the remainder of silicon nitride.

4,218,258

HYDRAULIC CEMENT ADHESIVE COMPOSITIONS

Henry M. Rothberg, Woodbridge, Conn., assignor to Laticrete International, Inc., Woodbridge, Conn.

Filed May 30, 1978, Ser. No. 910,772

Int. Cl.[2] C04B *7/353*

U.S. Cl. 106—93 **16 Claims**

1. An improved hydraulic cement adhesive composition for use upon admixture with aqueous media comprising hydraulic cement, an alkyl derivative of cellulose, and a polyethylene oxide homopolymer having an approximate molecular weight ranging between 400,000 to 4,000,000 and having the common repeating structure:

$$-(O-CH_2CH_2)_n-$$

wherein n ranges from about 8,000 to 80,000, said polyethylene oxide homopolymer being provided in a range from about 0.1 to 5.0 weight %, based upon the weight of hydraulic cement.

4,218,259

POROUS SURFACE SEALING COMPOUND

Frank P. Garcia, 3047 Terrace Ave., Naples, Fla. 33940

Filed May 15, 1978, Ser. No. 906,242

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—98 **4 Claims**

1. A sealing compound and moisture barrier for use on porous surfaces such as a gravel roof comprising a mixture of a major proportion of portland cement with minor proportions of sand and calcium aluminate cements, for mixture in a predetermined amount of water, said minor proportions being sufficient amounts of sand and calcium aluminate cement, when mixed with said major proportion of portland cement and water, to cause a hardening while drying into a solid mass with the gravel of a gravel roof when applied in a penetrating relation thereto.

4,218,260

REFLECTIVE CONCRETE BODY, PROCESS FOR THE MANUFACTURE AND UTILIZATION OF THE SAME

Heinrich Metzler, St. Gallen, Switzerland, assignor to Institut für Privatwirtschaft Gschwend & Stadler, St. Gallen, Switzerland

Continuation of Ser. No. 847,989, Nov. 2, 1977, abandoned. This application Jan. 5, 1979, Ser. No. 1,258

Claims priority, application Switzerland, Nov. 19, 1976, 14588/76

Int. Cl.² C04B *7/08, 7/10*

U.S. Cl. 106—98 **12 Claims**

1. In a road surface having a top layer of reflex reflective concrete comprising a mixture of cement, hard filler material, glass balls and pigment, the improvement wherein:

(a) said cement is white Portland cement;

(b) said hard filler material is particulate white quartz of particle size smaller than that of said glass balls;

(c) said glass balls are colorless crystal glass balls comprising from 50 to 70% of said mixture and being arranged in a plurality of layers within said top layer of said road surface, the balls of the uppermost of said plurality of layers being exposed approximately to half their diameters; and

(d) said pigment is titanium dioxide.

4,218,261

RETARDER FOR GYPSUM PLASTER AND A PROCESS FOR RETARDING THE SETTING OF GYPSUM PLASTER BY THE USE THEREOF

Koji Takeuchi, Yokohama; Takashi Zama, and Shizuo Iwai, both of Kawasaki, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed May 23, 1979, Ser. No. 41,558

Claims priority, application Japan, Jun. 1, 1978, 53-66179

Int. Cl.² C04B *11/14, 11/22*

U.S. Cl. 106—111 **5 Claims**

1. A plaster composition comprising gypsum plaster and, as a retarder for retarding the setting thereof, β-hydroxy-β-carboxy-isocaproic acid or a water soluble salt thereof.

4,218,262

NONCLUMPING, DELAYED ACTION VISCOSITY INCREASING AGENT

Charlotte L. Warren, Tuxedo Park, N.Y., assignor to Balchem Corporation, State Hill, N.Y.

Filed Nov. 2, 1978, Ser. No. 956,850

Int. Cl.² C08L *5/00*

U.S. Cl. 106—206 **20 Claims**

1. A nonclumping, delayed action viscosity increasing agent comprising

(a) 90 to 10% core particles of xanthan gum, and

(b) 10 to 90% encapsulating coating on said particles comprising:

(i) 90 to 99.5% of a fat derivative selected from the group consisting of fatty acids having from 12 to 22 carbon atoms, monoglycerides of fatty acids having from 12 to 22 carbon atoms, diglycerides of fatty acids having from 12 to 22 carbon atoms and mixtures thereof; and

(ii) 0.5 to 10% of a surfactant;

said coating having a hydrophilic/lipophilic balance from 3.5 to 10.

4,218,263

PROCESS FOR PREPARING OXYGEN-CONTAINING WAXES

Nobuaki Kawabata, and Nobuo Yokoyama, both of Yokohama, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,783

Claims priority, application Japan, Dec. 12, 1977, 52-148211

Int. Cl.² C07D *307/60;* **C08L** *91/06*

U.S. Cl. 106—270 **17 Claims**

1. A process for preparing an oxygen-containing wax by mixing 10–80 parts by weight of a saturated petroleum fraction wax melting in the range of 50°–85° C. with 20–90 parts by weight of an unsaturated polyolefin wax having a melting point of 36°–120° C., a number average molecular weight of 310–1,000 and 5–50 double bonds per 1,000 carbon atoms to form a wax mixture and then reacting 100 parts by weight of the thus-formed wax mixture with 3–25 parts by weight of an unsaturated polycarboxylic acid or anhydride thereof in the presence of an organic peroxide, thereby to prepare the oxygen-containing wax.

13. A process according to claim 1, 2 or 3, wherein the reaction is effected at 120°–220° C. for 0.5–6 hours.

17. An oxygen-containing wax obtained by the process of claim 13.

4,218,264

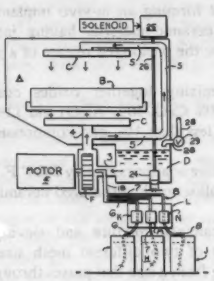
DISHWASHER UTILIZING PUMP IMPELLER SUCTION FOR FEEDING DETERGENT, SANITIZING AGENT AND RINSE AID IN TIMED SEQUENCES

George J. Federighi, and George B. Federighi, both of 70 Thirteenth St., San Francisco, Calif. 94105

Filed Mar. 9, 1979, Ser. No. 18,994

Int. Cl.² B08B *3/02*

U.S. Cl. 134—95 **4 Claims**



1. In a dishwasher:

(a) a wash/rinse compartment for receiving dishes and having spray arms therein for spraying wash or rinse water onto the dishes;

(b) a tank underlying said compartment for receiving wash or rinse water therefrom;

(c) a motor driven impeller for receiving wash or rinse water from said tank and forcing it through said spray arms and onto the dishes;

(d) a container for holding a liquid detergent;

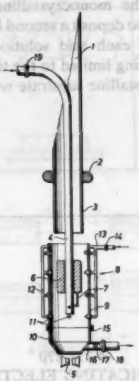
(e) a valve controlled conduit leading from said container, the conduit having an open end disposed adjacent to the center of said impeller where the greatest suction is created, this suction being the sole means for removing the detergent from said container and delivering it to the area surrounding the impeller where the detergent is mixed with the wash water as it passes from the tank and is forced through said spray arms for washing the dishes; and

(f) means for timing the opening and closing of the valve for delivering the proper volume of detergent into the wash water at the proper time.

4,218,265
METHOD AND AN ARRANGEMENT FOR THE CLEANING OF A FILLER PIPE IN A PACKING MACHINE

Alfred Fuchs, Lund, and Erik T. Andersson, Dalby, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Oct. 4, 1978, Ser. No. 948,408
Claims priority, application Sweden, Oct. 5, 1977, 7711137
Int. Cl.² B08B 3/02
U.S. Cl. 134—18 **16 Claims**



9. A method of cleaning a filler pipe of a packing machine, especially of a machine which forms a packing material tube around the filler pipe, the tube then being filled with contents and divided up into filled and closed packages by sealing jaws arranged beneath an end of the filler pipe, comprising the steps of:

providing a first member of a cleaning container separate from the packing material tube around a lower end of the filler pipe;

connecting a second member of the cleaning container to a lower end of the first member to form the cleaning container;

selectively supplying cleaning liquid to the container; and withdrawing the cleaning liquid from the container.

4,218,266
LIQUID HYDROCARBON-FUELED THERMO-ELECTRIC GENERATOR WITH COUNTER-FLOW TYPE REGENERATIVE HEAT EXCHANGER

Guido Guazzoni, Wayside, and Andrew Herchakowski, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1978, Ser. No. 971,766
Int. Cl.² H01L 35/28
U.S. Cl. 136—209 **5 Claims**

1. A thermoelectric generator which comprises:

a combustion chamber having an inlet end and an outlet end;

a thermoelectric converter associated with the walls of said combustion chamber;

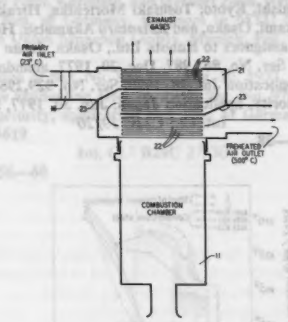
a source of a liquid hydrocarbon fuel;

means for atomizing said fuel;

means for supplying air to mix with said atomized fuel to thereby form a combustible mixture;

means for igniting said combustible mixture, said mixture burning in the combustion chamber to heat said thermoelectric converter, the exhaust gases resulting from said combustion passing out of said generator through the outlet end of said combustion chamber; and

means, associated with the outlet end of said combustion chamber, for pre-heating the air supplied to mix with said

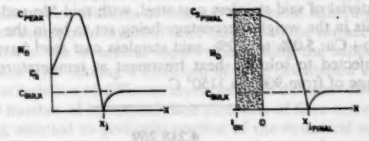


atomized fuel thereby to increase the efficiency of said generator.

4,218,267
MICROELECTRONIC FABRICATION METHOD MINIMIZING THRESHOLD VOLTAGE VARIATION

Roy L. Maddox, Jr., Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 23, 1979, Ser. No. 32,610
Int. Cl.² H01L 21/265, 29/78
U.S. Cl. 148—1.5 **9 Claims**



1. A method of making a semiconductor circuit having a substantially uniform doping concentration on the surface thereof and a substantially uniform threshold voltage from a body of semiconductor material of a predetermined conductivity type and resistivity, comprising the steps of:

defining a pattern on a laterally extending major surface of said body where devices are to be formed;

ion implanting locations defined by said pattern on said body a single time with dopant species for forming regions with a predetermined concentration profile of semiconductor material of different resistivity in said body, the maximum concentration of the dopant species lying below said major surface of said body by a predetermined distance and the concentration of the dopant species at the body surface is less than or equal to 10^{18} atoms/cm^3, and

subsequently forming devices having substantially the same threshold voltage at said regions during which step said major surface of said body moves with respect to the location of the maximum concentration of the dopant species so that the maximum concentration of the dopant species lies at said major surface of said body at the completion of the step of forming devices.

4,218,268

HIGH CORROSION RESISTANT AND HIGH STRENGTH MEDIUM CR AND LOW NI STAINLESS CAST STEEL

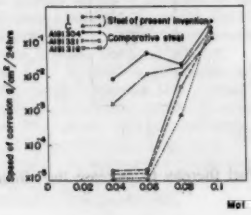
Hisashi Hiraishi, Kyoto; Toshiaki Morichika, Hirakata; Shinichi Murakami, Osaka, and Katsutaro Akamatsu, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Division of Ser. No. 862,987, Dec. 20, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 929,295

Claims priority, application Japan, Jun. 30, 1977, 52/79195

Int. Cl.[2] C22C *39/20*

U.S. Cl. 148—38 12 Claims



1. A high corrosion resistant and high strength medium Cr and low Ni stainless cast steel which consists essentially of, in weight percentage, C: 0.1% and below, Si: 1.5% and below, Mn: 2.0% and below, P: 0.04% and below, S: 0.04% and below, Cr: 17.0% to 20.0%, Ni: 3.0% and 7.0%, Mo: 1.5% to 2.5%, —Cu: 5.0% to 7.0%, N: 0.1% and below and the remaining portion substantially of Fe to form material of said stainless cast steel, said stainless cast steel having been subjected to solution heat treatment at temperatures in the range of from 900° to 1150° C., followed by cooling the heat-treated stainless steel.

4. A high corrosion resistant and high strength medium Cr and low Ni stainless cast steel which consists essentially of, in weight percentage, C: 0.1% and below, Si: 1.5% and below, Mn: 2.0% and below, P: 0.04% and below, S: 0.04% and below, Cr: 17.0% to 20.0%, Ni: 3.0% to 7.0%, Mo: 1.5% to 2.5%, Cu: 2.5% to 5.0%, W: 0.2% to 2.0%, N: 0.1% and below and the remaining portion substantially of Fe to form the material of said stainless cast steel, with said Mo and Cu contents in the weight percentage being set to be in the range of Mo+Cu: 5.0% to 7.0%, said stainless cast steel having been subjected to solution heat treatment at temperatures in the range of from 900° to 1150° C.

4,218,269

METHOD FOR THE EPITAXIAL DEPOSITION OF SEVERAL LAYERS

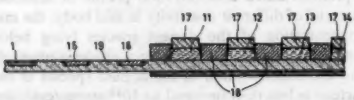
Theodorus G. J. van Oirschot; Willem J. Leswin; Petrus J. A. Thijs, and Willem Nijman, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,228

Claims priority, application Netherlands, Nov. 9, 1977, 7712315

Int. Cl.[2] H01L *21/208*

U.S. Cl. 148—171 4 Claims



1. A method of manufacturing a semiconductor device having a monocrystalline substrate and a plurality of epitaxial layers successively deposited on the substrate by successively contacting the substrate with solutions which are previously saturated by contact with a plurality of auxiliary substrates, in which the monocrystalline substrate, the auxiliary substrates and the solutions are cooled before the layers are deposited, which comprises:

contacting a first auxiliary substrate with a first solution;

contacting a second auxiliary substrate with said first solution while simultaneously contacting the first auxiliary substrate with a second solution;

contacting the monocrystalline substrate with said first solution to deposit a first layer thereon while simultaneously contacting said second auxiliary substrate with said second solution; and

then contacting the monocrystalline substrate with said second solution to deposit a second layer thereon, the total contact time of each said solution with said auxiliary substrates not being limited to the time of a single contact of said monocrystalline substrate with any solution.

4,218,270

METHOD OF FABRICATING ELECTROLUMINESCENT ELEMENT UTILIZING MULTI-STAGE EPITAXIAL DEPOSITION AND SUBSTRATE REMOVAL TECHNIQUES

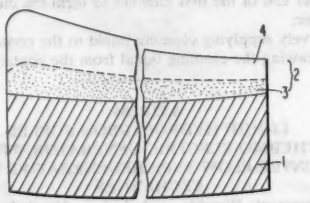
Shinichi Hasegawa, and Hisanori Fujita, both of Tsughiura, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,957

Claims priority, application Japan, Nov. 22, 1976, 51-140443; Nov. 26, 1976, 51-141959

Int. Cl.[2] H01L *21/20, 21/302*

U.S. Cl. 148—175 8 Claims



1. A method of fabricating an electroluminescent device comprising the steps of:

preparing a monocrystalline semiconductor substrate,

growing on said substrate a first region of an epitaxial layer of a compound semiconductor material of a high carrier density,

continuing to grow said epitaxial layer but with a reduced carrier density to form a second region of said epitaxial layer;

diffusing impurities into said second region of said epitaxial layer having said reduced carrier density to form a p-n junction therein; and

polishing said substrate having formed thereon said epitaxial layer having said p-m junction to substantially remove said substrate material to form a diode wafer one surface of which comprises said first region of said epitaxial layer having said high carrier density.

4,218,271

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES UTILIZING A SURE-STEP MOLECULAR BEAM DEPOSITION

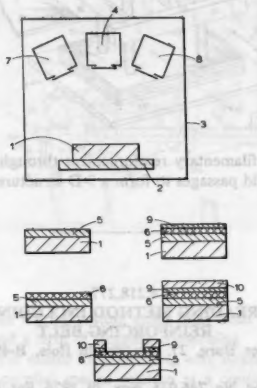
Colin E. C. Wood, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,705

Claims priority, application United Kingdom, Apr. 13, 1977, 15291/77

Int. Cl.[2] H01L *21/203, 23/48*

U.S. Cl. 148—175 5 Claims



1. A method of manufacturing a semiconductor device comprising the steps of depositing a first layer of one of the elements Sn, Ge, Si, Be, Mn, or Mg on a III–V compound stratum by molecular beam deposition, and depositing a second layer of a III–V compound material containing said one element as a component on said first layer by molecular beam deposition.

4,218,272

WATER-IN-OIL NCN EMULSION BLASTING AGENT

James W. Brockington, Allentown, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Dec. 4, 1978, Ser. No. 966,144

Int. Cl.[2] C06B *45/02*

U.S. Cl. 149—21 27 Claims

1. A water-in-oil emulsion blasting agent composition having a single oxidizer that propagates under water consisting of:

(a) a continuous phase of carbonaceous fuel;

(b) a discontinuous aqueous phase containing ammonium nitrate as the only oxidizer with the aqueous phase present in a ratio of aqueous phase to fuel in the range of from about 95:5 to about 93:7 by weight thereof;

(c) from about 0.7% to about 2% of an emulsifier by weight thereof;

(d) from about 2.0% to about 4.0% of an oil by weight thereof;

(e) wax present in the composition in a ratio of wax to oil of no more than about 1:1 by weight; and

(f) sufficient closed cell void containing material to yield a density of said blasting agent of from about 1.20 grams per cubic centimeter to about 1.35 grams per cubic centimeter.

4,218,273

METHOD OF MANUFACTURING STRUCTURAL COMPONENTS

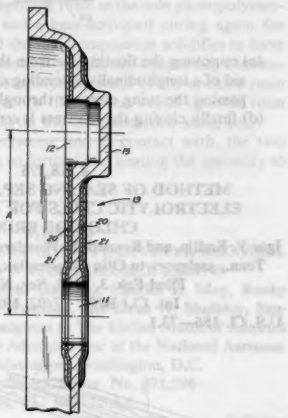
Wolf-Dieter Feist, Karlsfeld, and Herbert Zech, Neubiberg, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 823,375, Aug. 10, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 973,256

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636619

Int. Cl.[2] B29C *27/30*

U.S. Cl. 156—60 5 Claims



1. A method of reducing stress on mechanical parts caused by differences in coefficients of thermal expansion between the parts and their structural support, comprising the steps of providing a structural support having at least two spaced apart support points at which mechanical parts are supported, the materials of the mechanical parts and the structural support having different coefficients of thermal expansion, adhering a plurality of superposed layers of fibre material to the surface of the portion of the structural support containing the support points, each layer having a direction of fibre orientation and the fibre orientation of different layers being in different directions, the number of layers and their direction of fibre orientation being selected to give said portion of the structural support a coefficient of thermal expansion so related to the coefficient of thermal expansion of the mechanical parts that the distance between said support points and the distance between said parts supported at the support points varies at substantially the same rate with temperature variations.

4,218,274

METHOD OF CONSTRUCTING A BAFFLED WATERBED MATTRESS

Carlos A. Mollura, 2824 Del Oro Pl., Fullerton, Calif. 92632

Filed Apr. 5, 1979, Ser. No. 27,369

Int. Cl.[2] B29C *27/04;* H05B *7/06*

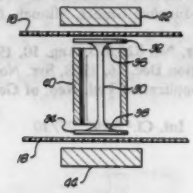
U.S. Cl. 156—65 2 Claims

1. A method of constructing a baffled waterbed mattress:

(a) which comprises attaching, to the upper and lower layers of a mattress bag, a series of individual plastic baffles each comprising a unitary structure with an attachment pad at opposite ends with a tying member extending between the pads leaving a peripheral pad area for attachment to the mattress layers;

(b) said method including the welding of each baffle by the aid of a hollow floating die surrounding the tying member to engage, at opposite ends, said peripheral pad areas of

the baffle while flat parts of a dielectric heating machine are closed about the mattress layers, the baffle and the floating die; and



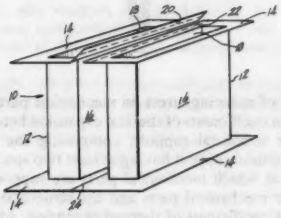
(c) removing the floating die from the attached baffle by the aid of a longitudinally extending slot in the floating die by passing the tying member through the slot;
(d) finally closing the mattress layers.

4,218,275

METHOD OF SEALING SEPARATORS FOR ELECTROLYTIC CELLS FOR ALKALI METAL CHLORIDE BRINES

Igor V. Kadija, and Kenneth E. Woodard, Jr., both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 3, 1978, Ser. No. 875,039
Int. Cl.[2] B29C *27/02;* H01M *2/14*
U.S. Cl. 156—73.1 **10 Claims**



1. A method for sealing a separator material for electrolytic cells for alkali metal chloride brines which comprises:
(a) coating a first portion of said separator material with a synthetic thermoplastic resin sealing agent which is a halogenated polyolefin selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, polytetrafluoroethylene, fluorinated ethylene-propylene (FEP), polychlorotrifluoroethylene, polyvinyl fluoride, polyvinylidene fluoride, and copolymers of ethylene-chlorotrifluoroethylene, and mixtures thereof,
(b) contacting said first coated portion with a second portion of said separator material, and
(c) ultrasonically sealing said contacted portions, said sealing being carried out at a temperature below which said first portion and said second portion could be sealed to themselves.

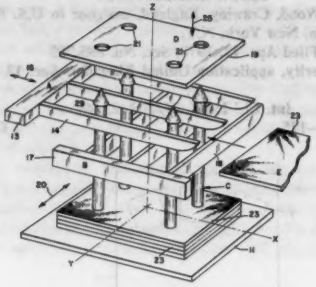
4,218,276

METHOD FOR MAKING 3-D STRUCTURES

Robert W. King, Lexington, Mass., assignor to Avco Corporation, Wilmington, Mass.

Continuation of Ser. No. 240,177, Mar. 31, 1972, abandoned. This application Oct. 16, 1974, Ser. No. 516,430
Int. Cl.[2] B32B *7/08*
U.S. Cl. 156—92 **13 Claims**

1. A method of fabricating a 3-D structure comprising the steps of:
providing a plurality of layers of a reinforcing fabric;
piercing said layers to provide a plurality of prearranged spaced passges through said fabric layers; and



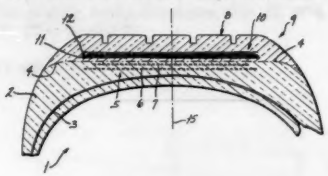
threading filamentary reinforcement through said passages to fill said passages to form a 3-D structure.

4,218,277

TIRE RETREADING METHOD INCLUDING ADDING REINFORCING BELT

Sjirk Van Der Burg, 27, Avenue du Bois, B-4920 Embourg, Belgium

Division of Ser. No. 746,035, Nov. 29, 1976, Pat. No. 4,135,565. This application Oct. 23, 1978, Ser. No. 953,386
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556930
Int. Cl.[2] B29H *17/36;* B60C *9/18*
U.S. Cl. 156—96 **3 Claims**



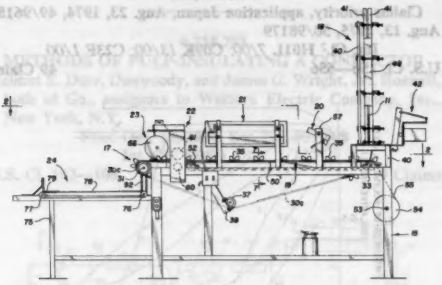
1. A method of recapping a pneumatic tire having a radial carcass and a first circumferential reinforcement belt formed with steel cords at angles between 10 and 30 degrees comprising, stripping the unusable tread from the tire to form a circumferential recapping surface at a predetermined depth that maintains the first reinforcement belt intact, winding an unvulcanized second reinforcement belt of heat shrinkable rubberized textile cord material in spiral arrangement around said recapping surface for at least one full winding under a predetermined tension to stretch the textile cord material by 1 to 5 percent from its rest state and to provide overlapping end portions that overlap a predetermined amount with the textile cord elements being oriented parallel to the equatorial plane of the tire, subdividing a predetermined portion of said second reinforcement belt into spaced marginal strips arranged to overlap the marginal edges of said first reinforcement belt, applying an unvulcanized tread strip around said recapping surface over the second reinforcement belt and vulcanizing the recapped tire components on the recapping surface to provide a firm bond between the recapping surface and the tread strip, between the recapping surface and the second reinforcement belt and between the tread strip and the second reinforcement belt.

4,218,278

APPARATUS AND METHOD FOR FABRICATING STAKE FLAGS

Edwin E. McMackin, and Waymon E. McMackin, both of 131 Yorktown, Dallas, Tex. 75208

Filed Jun. 19, 1978, Ser. No. 916,718
Int. Cl.² B65H *81/06;* B32B *31/18, 31/20*
U.S. Cl. 156—187 12 Claims



1. Apparatus for fabricating stake flags from a plurality of wire stakes and a strip of flagging comprising

first conveyor means for conveying wire stakes transversely in fixed parallel spaced relation at a continuous rate of speed;

second conveyor means for conveying a strip of flagging at the same continuous rate of speed, and for supporting said strip of flagging in a path coincident with the path of one end of said stakes, whereby said one end of said stakes are maintained adjacent to said strip of flagging;

means for applying adhesive to said one ends of said stakes and the adjacent portions of said flagging, during conveyance in said coincident paths, to effect adhesion thereof

cutter means disposed at a fixed station relative to said second conveyor means for severing said flagging strip, adhering to said stakes, a selected distance behind each stake and ahead of a succeeding stake, to form a flagging segment associated with each stake, including a lead tab and a trailing portion;

means operative on each stake, during conveyance thereof following the forming of its respective flagging segment, for rotating said stake about its support axis, to rotate said lead tab to a position contiguous to said trailing portion to effect the bonding thereof.

8. A method for fabricating stake flags from wire stakes and a strip of flagging, comprising the steps

conveying a plurality of stakes transversely in parallel spaced relation at a continuous rate;

conveying a strip of flagging, at the same continuous rate, along a path coincident with the path of one end of the conveyed stakes, whereby said flagging strip and said one end of the stakes are conveyed in adjacent relation;

applying an adhesive to said one end of the stakes and to adjacent portions of said flagging strip, during conveyance in said coincident paths, to effect adhering of the flagging strip to the stakes;

severing said adhering flagging strip between successive stakes, a selected distance therefrom, to form a flagging segment associated with each stake, including a lead tab and a trailing portion;

and rotating said stake and adhering flagging segment about the support axis of said stake and during the conveyance thereof, to position said lead tab contiguous to the following flagging portion to effect the bonding thereof.

4,218,279

BONDING METHOD EMPLOYING FILM ADHESIVES CONTAINING AN EPOXIDE RESIN

George E. Green, Stapleford, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 27, 1978, Ser. No. 919,579
Claims priority, application United Kingdom, Jul. 5, 1977, 28142/77
Int. Cl.² B29C *19/02;* C08F *8/18*
U.S. Cl. 156—272 12 Claims

1. A method for bonding two surfaces together which comprises

(i) exposing to actinic radiation a layer of a liquid composition containing an epoxide resin as the sole photopolymerisable component and a heat-activated curing agent for epoxide resins until the said composition solidifies to form a partially cured, essentially solid, self-supporting continuous film due to photopolymerisation of the epoxide resin through epoxide groups thereof but which epoxide resin remains substantially in the thermosettable state, and

(ii) sandwiching between, and in contact with, the two surfaces the film so formed and heating the assembly to cure the resin.

4,218,280

METHOD OF CROSS-LINKING POLYVINYL ALCOHOL AND OTHER WATER SOLUBLE RESINS

Warren H. Philipp, North Olmsted; Charles E. May, Rocky River; Li-Chen Hsu, Westlake, and Dean W. Sheibley, Sandusky, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 20, 1978, Ser. No. 971,596
Int. Cl.² B05D *3/06*
U.S. Cl. 156—272 6 Claims

1. A method of making a separator for an alkaline battery by cross-linking a pre-formed water soluble polymer comprising the steps of: providing an aqueous solution comprising a mixture of polyvinyl alcohol and up to 50% by weight, based on the weight of the polyvinyl alcohol, of polyacrylic acid; casting a film of the aqueous polymer solution; drying the film to form a self-supporting sheet structure capable of being cross-linked by reaction with hydrogen atom radicals and hydroxyl molecule radicals; contacting the polymer sheet structure with an aqueous solution having a pH of less than 8 and containing a dissolved salt in an amount sufficient to prevent substantial dissolution of the polymer sheet structure in the aqueous solution; irradiating the aqueous solution with ionizing radiation to form hydrogen atom radicals and hydroxyl molecule radicals; and maintaining said radiation for a time sufficient to effect cross-linking of the water soluble polymer to produce a water insoluble cross-linked polymer alkaline battery separator.

4,218,281

MANUFACTURING PROCESS FOR AN ELECTROOPTIC DISPLAY DEVICE

Rino Doriguzzi, Dottingen; Markus Egloff, Wettingen; Meinolph Kaufmann, Fislisbach, and Terry J. Scheffer, Forch, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Division of Ser. No. 792,591, May 2, 1977, Pat. No. 4,126,383. This application Jun. 1, 1978, Ser. No. 911,663
Claims priority, application Switzerland, Jun. 3, 1976, 7003/76
Int. Cl.² G02F *1/03;* B32B *31/12*
U.S. Cl. 156—281 3 Claims

1. A process for the manufacture of an electro-optical display device including a circuit board and a liquid crystal display cell mounted on said circuit board, comprising the steps of:

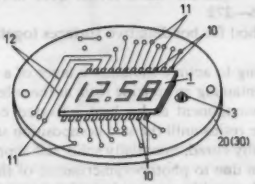
forming a circuit board having at least one light conducting region;

disposing said liquid crystal display cell adjacent the light conducting region of the circuit board;

locating at least one light emitting element in the circuit board for illuminating the light conducting region;

attaching a semi-transparent reflector to said liquid crystal cell;

wherein said circuit board forming step further comprises,



producing a reflective layer by depositing a reflective material on part of a substrate;

providing a light diffusing layer;

embedding together the reflecting layer and the light diffusing layer in a transparent resin to form a unit, said unit forming at least one integral portion of said circuit board.

4,218,282

METHOD OF PREPARATION OF CHRYSOBERYL AND BERYL SINGLE CRYSTALS

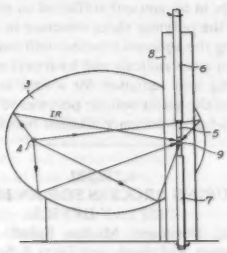
Akihiko Kochi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 915,847

Claims priority, application Japan, Jun. 17, 1977, 52-72485; Jul. 4, 1977, 52-80240

Int. Cl.[2] B01J *17/10, 17/16*

U.S. Cl. 156—620 **23 Claims**



1. A method of manufacturing chrysoberyl and beryl single crystal, comprising the steps of shaping a mix into a rod, forming a melt zone in said rod by use of infra-red rays generated by one of a halogen lamp and a xenon lamp, said lamp and said melt zone being positioned respectively at the first and second foci of an internally reflecting ellipsoid, and moving said rod through said second focus, thereby moving said melt zone along said rod, said mix in the portion of the rod to be converted into said single crystal consisting essentially of alumina and beryllium oxide for manufacture of chrysoberyl, and of alumina, beryllium oxide and silica for manufacture of beryl.

4,218,283

METHOD FOR FABRICATING SEMICONDUCTOR DEVICE AND ETCHANT FOR POLYMER RESIN

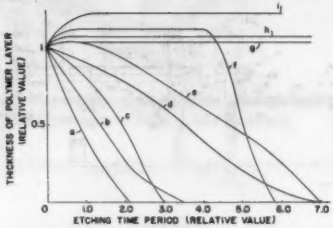
Atsushi Saiki, Musahimurayama; Toshio Okubo, Tokyo, and Seiki Harada, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 695,040, Jun. 11, 1976, Pat. No. 4,113,550, which is a continuation-in-part of Ser. No. 607,562, Aug. 25, 1975, abandoned. This application Jul. 12, 1978, Ser. No. 924,008

Claims priority, application Japan, Aug. 23, 1974, 49/96157; Aug. 13, 1975, 50/98179

Int. Cl.[2] H01L *7/00;* **C09K** *13/00;* **C23F** *1/00*

U.S. Cl. 156—656 **49 Claims**



1. A method for fabricating a semiconductor device comprising the steps of:

forming, on a body, a layer of cured polymer resin selected from the group consisting of polyimide and polyimide-iso-indroquinazolinedione and cured at 260°–450° C.; and

contacting an etchant consisting essentially of hydrazine or hydrazine hydrate and at least one polyamine shown by a chemical formula of

$$NH_2.R.NH_2$$

wherein R is selected from divalent radicals having 2–6 carbon atoms, the temperature of said etchant being in a range from 25° C. to 35° C., to a prescribed portion of said cured layer so as to form an opening at said prescribed portion.

32. An etchant for a polymer resin selected from the group consisting of polyimide and polyimide-iso-indroquinazolinedione and cured at 260°–450° C., consisting essentially of hydrazine and at least one polyamine shown by a chemical formula of

$$NH_2.R.NH_2$$

wherein R is selected from divalent radicals having 2–6 carbon atoms, with the volume % of said at least one polyamine being between 30% and 50%.

4,218,284

PROCESS FOR THE INHIBITION OF THE FORMATION OF DEPOSITS IN CELLULOSE PULPING AND CELLULOSE PULP TREATING PROCESSES

Bengt G. Hultman, Domsjo, and Rolf C. Nilsson, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed May 3, 1978, Ser. No. 902,321

Claims priority, application Sweden, Jul. 25, 1977, 7708523

Int. Cl.[2] D21C *11/00*

U.S. Cl. 162—38 **14 Claims**

1. A process for inhibiting the formation of deposits in cyclic cellulose pulping or cellulose pulp treating processes in which chemicals are recovered from spent liquors and recycled, thereby reducing the need for shutdown of equipment for cleaning, which comprises carrying out the cellulose pulping

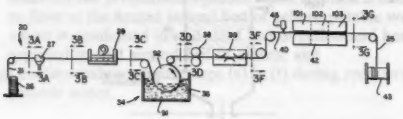
or cellulose pulp treating in a liquor having dissolved therein an amount within the range from about 0.001% to about 0.15% by weight of the dry lignocellulosic material of aluminum cation capable of forming liquor-soluble complexes with deposit-forming anions and thus retaining the deposit-forming anions in solution in the cellulose pulping or cellulose pulp treating liquor and inhibiting the formation of deposits at every stage of the cyclic process in which such deposits may form, including the chemicals recovery stage by maintaining said aluminum cation in said range throughout the cyclic process.

4,218,285

METHODS OF PULP-INSULATING A CONDUCTOR

Helmut E. Durr, Dunwoody, and James G. Wright, Jr., Roswell, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 16, 1978, Ser. No. 951,808
Int. Cl.² B05D *3/06, 5/12*
U.S. Cl. 162—106 **9 Claims**



2. A method of making a pulp-insulated electrical conductor, said method including the steps of:

enclosing an electrical conductor in a coating which when exposed for a predetermined time to a first temperature is partially dried to render it substantially insoluble in water and essentially non-tacky, and which when covered with pulpous material and exposed for a predetermined time to a second temperature that is substantially greater than said first temperature is further dried and tackified;

exposing said electrical conductor which is enclosed in said coating for a predetermined time to said first temperature;

enclosing said electrical conductor, which is enclosed in said coating, in an insulative cover of pulpous material having a relatively high moisture content and being disposed concentrically about the conductor; and

exposing said coating and said cover of pulpous material for a predetermined time to said second temperature to reduce substantially the moisture content of the cover of pulpous material and to further dry and to tackify the coating which cause the crush resistance of the pulpous material to be increased so that it remains substantially concentrically disposed about the conductor and which cause the pulpous material to adhere to the conductor to form an insulative cover having substantial integrity.

4,218,286

PAPER HAVING GOOD ABSORBENCY AND ALKALI RESISTANCE AND METHOD OF MAKING SAID PAPER

Newlyn Jones, Berwick-upon-Tweed, England, and Alistair C. Stewart, Newtonlea, Scotland, assignors to C. H. Dexter Limited, Great Britain

Continuation-in-part of Ser. No. 809,118, Jun. 22, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,452
Int. Cl.² D21H *3/24, 3/26, 3/58*
U.S. Cl. 162—164 R **16 Claims**

1. A process for the production of absorbent fibrous webs of improved alkaline wet tensile strength comprising the steps of forming a fibrous web material, treating the fibers of the web material with an aqueous solution of a water-soluble cationic, thermosetting, polyamide or polyamine epihalohydrin-containing resin to provide in the web about 0.05% to 4.0% by weight of said resin on a dry weight basis, treating the fibers of the web material with an aqueous solution of a non-viscose film-forming polymer material containing a hydroxyl group to provide in the web about 0.5% to 8.0% by weight of said film-forming material on a dry weight basis and treating the fibers of the web material with an aqueous solution of a polyalkylene imine polymer to provide in the web about 0.05% to 2.0% by weight of said polymer on a dry weight basis.

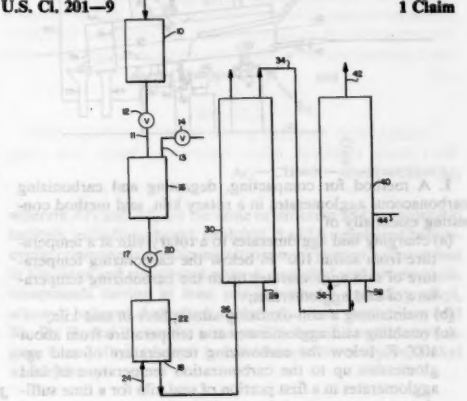
12. A water absorbent fibrous sheet material of improved alkaline wet tensile strength comprising a fibrous web containing about 0.05% to 4.0% by weight on a dry weight basis of a water-soluble cationic, thermosetting polyamide or polyamine epihalohydrin-containing resin, about 0.5% to 8.0% by weight on a dry weight basis of a non-viscose film-forming polymer material containing a hydroxyl group and about 0.5% to 8.0% by weight on a dry weight basis of a polyalkylene imine polymer.

4,218,287

METHOD OF AVOIDING AGGLOMERATION IN FLUIDIZED BED PROCESSES

Charles W. Albright, S. Charleston, and H. G. Davis, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 536,843, Dec. 27, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,920
Int. Cl.² C10B *49/22, 55/10, 57/08*
U.S. Cl. 201—9 **1 Claim**



1. A method of substantially preventing agglomeration of solid carbonaceous particles in a fluid-bed reaction zone maintained at a reaction temperature above about 500° C. and containing a matrix of non-agglomerating particles at said reaction temperature, said method comprising:

a. introducing said solid carbonaceous particles in a dense phase in a carrier gas into the lower portion of said zone in an essentially vertically upwards direction at a predetermined velocity in excess of about 200 feet per second, said solid carbonaceous particles having been pre-heated to a predetermined temperature below their plastic transformation temperature, and being injected directly into said zone and into direct contact with the non-agglomerating particles therein through inlet means substantially at the bottom of said zone;

b. introducing a reagent into said zone for reaction with said solid carbonaceous particles at said reaction temperature within said zone; and

c. introducing liquid hydrocarbons as a separate injection stream into the lower portion of said zone in an essentially vertically upwards direction simultaneously with said introduction of solid carbonaceous particles and at a predetermined fluid velocity sufficient to rapidly and uniformly disperse said hydrocarbons within the matrix, said reagent introduced into the reaction zone reacting with

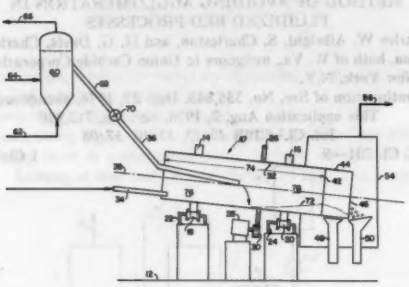
said hydrocarbons as well as with said solid carbonaceous solids, whereby said solid carbonaceous particles and said liquid hydrocarbons are rapidly and uniformly dispersed within said matrix so that agglomeration of said particles is substantially prevented.

4,218,288

APPARATUS AND METHOD FOR COMPACTING, DEGASSING AND CARBONIZING CARBONACEOUS AGGLOMERATES

Frank W. Theodore, Pittsburgh, Pa., assignor to Continental Oil Company, Stamford, Conn.

Filed Feb. 12, 1979, Ser. No. 11,724
Int. Cl.[2] C10B *47/18, 47/30*
U.S. Cl. 201—12 **5 Claims**



1. A method for compacting, degassing and carbonizing carbonaceous agglomerates in a rotary kiln, said method consisting essentially of:

(a) charging said agglomerates to a rotary kiln at a temperature from about 100° F. below the carbonizing temperature of said agglomerates up to the carbonizing temperature of said agglomerates;

(b) maintaining a non-oxidizing atmosphere in said kiln;

(c) tumbling said agglomerates at a temperature from about 100° F. below the carbonizing temperature of said agglomerates up to the carbonization temperature of said agglomerates in a first portion of said kiln for a time sufficient to compact and degas said agglomerates;

(d) mixing said compacted and degassed agglomerates with a finely divided heat transfer medium in a second portion of said kiln to produce a mixture of said heat transfer medium and said agglomerates at a temperature above the carbonization temperature of said agglomerates;

(e) tumbling said mixture at a temperature above the carbonization temperature of said agglomerates in said second portion of said kiln for a time sufficient to carbonize said agglomerates; and

(f) recovering said heat transfer medium and compacted, degassed, carbonized agglomerates from said second portion of said kiln.

4,218,289

DISTILLATION APPARATUS WITH A GRID PARTIAL CONDENSER

James D. Hajek, Houston, and Earl E. McReynolds, LaPorte, both of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

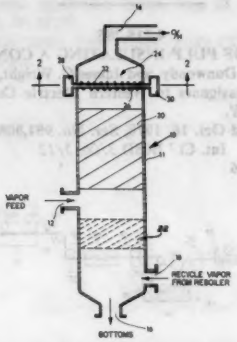
Filed Mar. 8, 1976, Ser. No. 664,762
Int. Cl.[2] B01D *3/16*
U.S. Cl. 202—161 **10 Claims**

1. In a fractional distillation column provided with an inlet port for introduction of feed, an exit port in the head of said column for removal of volatile overhead, an exit port in the base of said column for removing liquid bottoms, and packing disposed in at least part of said column; the improvement which comprises a partial condenser disposed in said column above the upper surface of said packing and below the said exit port in the head of said column, said partial condenser comprising:

a grid comprised of a plurality of substantially uniformly spaced linear hollow tubes;

said hollow tubes having their longitudinal axes in parallel relationship and disposed in a plane perpendicular to the vertical axis of said column;

the ends of each of said hollow tubes extending through the



side walls of said column to the exterior of the latter and being connected to fluid reservoir means located on the exterior of said column;

means for circulating heat exchange fluid through the interior of said tubes and said reservoir means;

means for controlling the temperature of said heat exchange fluid; and

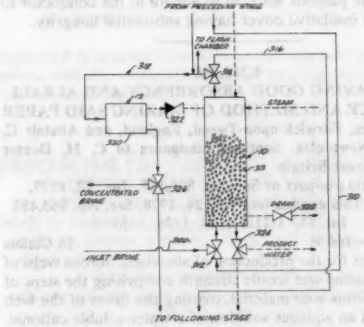
liquid runoff means installed in a plurality of locations on the outer surface of that portion of each of said hollow tubes which is located within said column.

4,218,290

HOT BED DESALINATION PROCESS

John R. Phillips, 911 Maryhurst Dr., Claremont, Calif. 91711, and Richard N. Jacobson, Bishop, Calif., assignors to John R. Phillips, Claremont, Calif.

Filed May 22, 1978, Ser. No. 907,953
Int. Cl.[2] C02B *1/04*
U.S. Cl. 203—11 **15 Claims**



1. In a process for the recovery of potable water from aqueous saline solutions wherein a pressurized aqueous saline solution is heated by contact with pellets above the temperature of the aqueous saline solution with attendant cooling of the pellets and wherein the heated aqueous saline solution is flash vapor-

ized to yield potable water vapors which are condensed by contact with pellets relatively cool with respect to the temperature of the vapors, the improvement which comprises:

(a) supplying at least part of the heat to an aqueous saline solution by passing said solution in contact with a first bed of contained pellets maintained in a static to fluidized state by the flow of pressurized aqueous saline solution therethrough;

(b) flash vaporizing a portion of the aqueous saline solution to generate vapors of potable water;

(c) recovering a portion of the heat supplied by condensing the vapors of potable water in contact with a second bed of contained pellets;

(d) heating a third bed of contained pellets to supplant the first bed of pellets;

(e) switching at a selected interval the flow of fluid whereby the aqueous saline solution is caused to flow to the heated third bed pellets, water vapor is condensed in the first bed of pellets and heat is supplied to the second bed of pellets;

(f) switching at another selected interval the flow of fluid whereby the pressurized aqueous saline solution is caused to flow to the heated second bed of pellets, potable water vapor is condensed in said third bed of pellets and heat is supplied to said second bed of pellets; and

(g) continuously repeating steps (a) to (f) during recovery of potable water.

4,218,291
PROCESS FOR FORMING METAL AND METAL SILICIDE FILMS

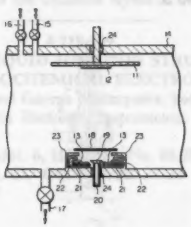
Toshihiko Fukuyama, and Shintaro Yanagisawa, both of Kawasaki, Japan, assignors to Vlsi Technology Research Association, Japan

Filed Feb. 28, 1979, Ser. No. 15,896

Claims priority, application Japan, Feb. 28, 1978, 53-22526/78; Feb. 28, 1978, 53-22527/78

Int. Cl.² C23C *15/00*

U.S. Cl. 204—1 T **19 Claims**



1. In a process for forming on a substrate a metal film comprising a transition metal silicide or silicides by sputtering a target,

the improvement which comprises constituting said target from said transition metal and performing said sputtering in an inert gas atmosphere which contains a silicon hydride.

6. A process for forming on a substrate a double layer structure by sputtering, said double layer structure comprising a transition metal layer and a transition metal silicide layer, said process comprising the steps of:

placing in a sputtering apparatus a target which comprises said transition metal;

introducing into said sputtering apparatus an inert gas and a silicon hydride gas;

sputtering said target, thereby forming said transition metal silicide layer;

terminating the introduction of said silicon hydride gas;

introducing an inert gas into said sputtering apparatus; and

sputtering said target, thereby forming said transition metal layer.

4,218,292
BRIGHT ZINC ELECTROPLATING BATH AND METHOD

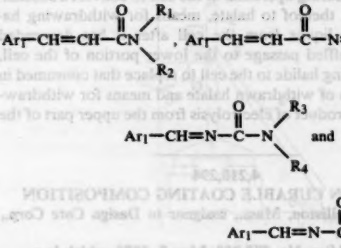
Jack D. Fellman, Brunswick; Harvey L. Kaufman, Hudson, both of Ohio, and Alan W. Stobbe, Mobile, Ala., assignors to McGean Chemical Company, Inc., Cleveland, Ohio

Filed Mar. 22, 1979, Ser. No. 22,983

Int. Cl.² C25D *3/22*

U.S. Cl. 204—55 R **35 Claims**

1. An aqueous acidic electroplating bath for the deposition of zinc which bath comprises zinc ions in an amount sufficient to deposit zinc metal on a substrate; chloride ions in an amount sufficient to impart the desired degree of electrical conductivity to said bath to obtain a bright zinc deposit; boric acid in an amount sufficient to buffer said bath to the desired pH to obtain a bright zinc deposit; and at least one brightener in an amount sufficient to obtain a bright zinc deposit, said brightener being selected from the group consisting of compounds represented by the formulae:



wherein Ar_1 and Ar_2 are the same or different and are aromatic radicals, including phenyl, naphthyl, 5 and 6 membered heterocyclic compounds containing nitrogen, oxygen or sulfur atoms in the rings and substituted phenyl, naphthyl and heterocyclic compounds having at least one substituent including alkyl, alkoxyl, halogen, haloalkyl, hydroxyl, nitrile and amino; and R_1, R_2, R_3 and R_4 are the same or different and include hydrogen, lower alkyl, phenyl, lower alkenyl, lower hydroxyalkyl and hydroxy.

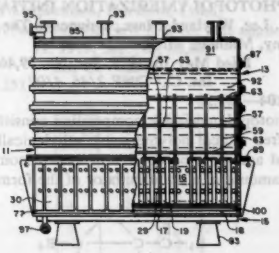
4,218,293
ELECTROCHEMICAL APPARATUS AND PROCESS FOR MANUFACTURING HALATES

Chester R. Nawrot, Depew, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Feb. 2, 1979, Ser. No. 8,725

Int. Cl.² C25B *1/26, 9/00*

U.S. Cl. 204—95 **25 Claims**



1. An apparatus for the manufacture of a halate which comprises an electrolytic cell including a plurality of monopolar dimensionally stable anodes and cathodes in spaced and paired relationship with one another, said anodes being holdable to the cell at a side thereof and being removable from the cell

through a side thereof, means for applying positive and negative electrical potentials to the anodes and cathodes, respectively, and means for moving electrolyte in the cell so that it conducts current between the anodes and the cathodes of the anode-cathode pairs, passes between the anodes and cathodes of the pairs and is at least partially electrolyzed thereby to hypohalite and gaseous electrolysis product, which means for moving the electrolyte include clearance passageways between anodes and cathodes of the pairs for conducting such hypohalite, electrolyte and gaseous electrolysis product upwardly, an enclosure covering the tops of at least four such passageways between anode and cathode pairs and narrowing down to a passageway less than 1/10 the horizontal cross-sectional area of such enclosure and extending upwardly from it to an upper part of the cell, which enclosure and upwardly extending passageway guide gas and liquid moving upwardly from the clearance passageways, and a passage to conduct hypohalite downwardly past baffles to a lower portion of the cell, said passage containing said hypohalite for a long enough period of time during operation of the cell to convert a substantial proportion thereof to halate, means for withdrawing halate-containing liquor from the cell after it has descended through the baffled passage to the lower portion of the cell, means for feeding halide to the cell to replace that consumed in the preparation of withdrawn halate and means for withdrawing a gaseous product of electrolysis from the upper part of the cell.

4,218,294

RADIATION CURABLE COATING COMPOSITION

Karl Brack, Holliston, Mass., assignor to Design Cote Corp., Natick, Mass.

Division of Ser. No. 575,252, May 7, 1975, which is a continuation-in-part of Ser. No. 400,364, Sep. 24, 1973, Pat. No. 3,989,609. This application Sep. 21, 1977, Ser. No. 835,477

Int. Cl.[2] C08F *2/46*; B05D *3/06*

U.S. Cl. 204—159.13 **14 Claims**

1. A radiation curable, film-forming, spreadable, unsaturated prepolymer material comprising

a reactive amine-containing polyamide prepolymer modified by condensation with a member selected from the group consisting of an unsaturated dicarboxylic acid anhydride or lower ester of such an acid, the portion of the modifying member to the remainder of the polymer being in the range from 10:1 to 1:10;

an admixture, with the modified amine-containing polyamide prepolymer, of one or more acrylate or methacrylate monomers; and

an aromatic ketone photoinitiator.

4,218,295

EPOXY-CARBONYL COMPOSITIONS AS PHOTOPOLYMERIZATION INITIATORS

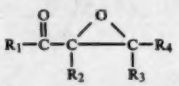
George A. Lee, Wayland, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 16, 1979, Ser. No. 39,463

Int. Cl.[2] C08F *2/46*, *4/00*

U.S. Cl. 204—159.23 **10 Claims**

1. A photopolymerizable composition consisting essentially of (1) a free radical polymerizable ethylenically unsaturated compound and (2) a photoinitiator system comprising (a) an effective amount of a photoinitiator of the formula:



wherein R_1 is hydrogen, aliphatic hydrocarbyl or aryl and R_2, R_3 and R_4 are independently hydrogen, aliphatic, aryl or

wherein R_5 is hydrogen, alkyl or aryl and (b) an effective amount of an electron donor compound.

4,218,296

PROCESS FOR ELECTROCOATING AQUEOUS DISPERSIONS OF CATHODIC RESINS

Allan E. Gilchrist, Westlake, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,539

Int. Cl.[2] C25D *13/06*, *13/10*

U.S. Cl. 204—181 C **8 Claims**

1. In a cathodic electrocoating process wherein cathodic resin is in aqueous bath dispersion by virtue of at least requisite neutralization of its ionizable amino base functionality with one or more acids that are neither a C_{1-4} fatty acid nor phosphoric acid, the improvement for correcting iron staining of the coating and/or corrosion of ferrous bath equipment which comprises:

adding to said bath dispersion, as at least a portion of the makeup material thereto, sufficient C_{1-4} fatty acid and phosphoric acid to establish a molar ratio of said fatty acid anions to $H_2PO_4^-$ anions in said bath dispersion between about 1:1 and about 3:1 while restricting the aggregate of free primary acid equivalents therein to not more than about 25% of that needed for complete neutralization of said cathodic resin.

4,218,297

ELECTROCHEMICAL GAUGE FOR OXYGEN HAVING AN INTERNAL REFERENCE AND SOLID ELECTROLYTE

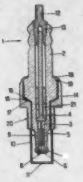
Marc Henault, Gieres, and Gerard Vitter, Saint Martin d'Heres, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed May 30, 1978, Ser. No. 910,626

Claims priority, application France, May 27, 1977, 77 16404

Int. Cl.[2] G01N *27/58*

U.S. Cl. 204—195 S **16 Claims**



1. In an electrochemical gauge for measuring partial pressures of oxygen, said gauge comprising a solid electrolyte and an internal reference, the improvement whereby the internal reference consists essentially of a lead: lead oxide redox couple.

4,218,298

SELECTIVE CHEMICAL SENSITIVE FET TRANSDUCER

Kiyoo Shimada, Kurashiki; Masayuki Matuo, and Masayoshi Esashi, both of Sendai, all of Japan, assignors to Kuraray Co., Ltd., Okayama and Tadayuki Matsuo, Sendai, both of, Japan

Filed Nov. 3, 1978, Ser. No. 957,433

Claims priority, application Japan, Nov. 4, 1977, 52/132679

Int. Cl.[2] G01N *27/30*

U.S. Cl. 204—195 M **11 Claims**

1. A chemical sensitive field-effect transistor device which comprises:

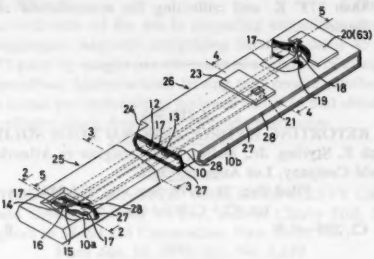
an elongated semiconductor substrate having one surface formed with a plurality of diffusion layers, said substrate constituted by a reduced width portion extending from one of the opposed ends of the substrate to a substantially intermediate portion thereof and an enlarged width por-

tion extending from the substantially intermediate portion to the other of the opposed ends thereof,

a gate region defined between the diffusion layers on the surface of said elongated substrate and adjacent the free end of the reduced width portion thereof,

electrodes electrically connected to the respective diffusion layers at a position adjacent the opposite end of said diffusion layers remote from said gate region,

source and drain regions formed on the surface portion of said substrate where the gate region is formed and extends between the reduced end enlarged width portions of said substrate,



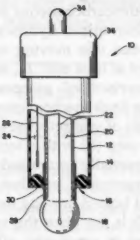
a double layered structure consisting of a layer of SiO_2 and an electrically insulating layer of Si_3N_4 overlaying said SiO_2 layer, said double layered structure covering substantially the reduced width portion of said substrate in its entirety, and said double layered structure covers the enlarged portion of said substrate at its opposed surfaces while the opposed side faces of the enlarged width portion are uncovered to allow the substrate to be exposed to the outside, said electrically insulating layer of said double layered structure having an impermeability to a solution containing a chemical substance which may affect the electric field developed in an electroconductive channel defined between the diffusion layers at the gate region.

4,218,299

SHORT PATH LIQUID JUNCTION STRUCTURE FOR ELECTROCHEMICAL ELECTRODES

Grover F. Lindell, and George Matsuyama, both of Santa Ana, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 6, 1979, Ser. No. 55,252
Int. Cl.[2] G01N *27/30, 27/36*
U.S. Cl. 204—195 F **4 Claims**



1. In an electrochemical electrode assembly including a nonconductive container having an opening receiving and surrounding a tubular or solid glass body, a coating of porous ceramic bonded to an outer circumferential surface of the glass body and extending axially thereon to provide a liquid junction path through which electrolytic communication is established between an electrolyte within the electrode assembly and a solution to be tested, an improved arrangement for closing the container opening comprising:

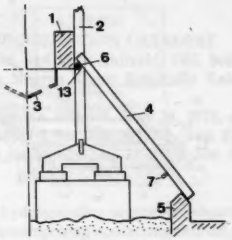
an annular sealing member having a sealing surface circumferentially engaging and sealing against the porous ceramic coating, the sealing surface being of arcuate configuration in axial cross-section to establish a generally annular line contact seal around the circumferential surface of the porous ceramic coating whereby a short path liquid junction is defined in the axial direction exclusively through the porous ceramic coating for the relatively short distance traversing the annular line contact seal.

4,218,300

COVERING FOR A CELL FOR FUSED SALT ELECTROLYSIS

Alfred Sturm, Steinen-Husinge, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 2, 1979, Ser. No. 63,346
Claims priority, application Switzerland, Aug. 24, 1978, 8979/78
Int. Cl.[2] C25C *3/22*
U.S. Cl. 204—247 **10 Claims**



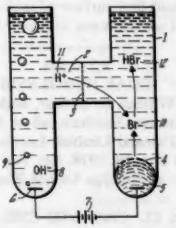
1. Electrolytic cell for the fused salt electrolytic reduction of aluminum oxide to metallic aluminum, comprising a pot lined with carbon, said pot having long sides, an anode beam which runs longitudinally above the cell and which can be raised and lowered, anode rods mounted on the side of the anode beam, a covering inclined downwards from the anode beam to the long sides of the pot and comprising individual lids butting onto each other at the sides thereof, in which in the region of the anode beam at least one rail is mounted on the side of the said beam on which rail the lids rest and a support mounted at the edge of the lid on the side facing the anode beam for holding up said lid at least when the anode beam is in the raised position, wherein said lids rest freely on the long sides of the reduction pot.

4,218,301

APPARATUS FOR PRODUCING HBR UTILIZING A CONSUMABLE BROMINE ELECTRODE

Daniel H. Grantham, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 956,761, Nov. 1, 1978. This application Jul. 11, 1979, Ser. No. 56,565
Int. Cl.[2] C25B *1/22*
U.S. Cl. 204—251 **11 Claims**



1. An electrolytic cell for the production of oxygen and

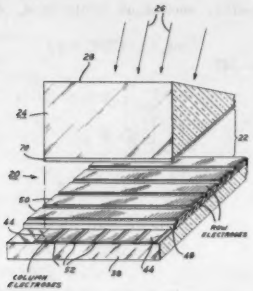
hydrogen bromide comprising an anode containing chamber and a cathode containing chamber separated by a hydrogen ion permeable membrane wherein the cathode is a metal electrode completely surrounded by liquid bromine containing dissolved therein bromide ions sufficient to conduct current through the liquid bromine.

4,218,302

ELECTROPHORETIC DISPLAY DEVICES

Andrew L. Dalisa, Cupertino, Calif., and Robert J. Seymour, Ossining, N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 2, 1979, Ser. No. 63,634
Int. Cl.[2] C25D *13/00*; G03G *15/00*; G05D *25/00*
U.S. Cl. 204—299 R **15 Claims**



1. An electrophoretic display system, comprising:
(a) a cell element including
(i) an insulating fluid containing colloidal particles in suspension, said fluid and said particles having respective refractive indices that are different from each other, a substantial number of said particles having a charge of one polarity;
(ii) a light transmissive first electrode;
(iii) a light transmissive second electrode spaced from said first electrode, said fluid being disposed between said first and second electrodes; and
(iv) a light transmissive first plate element disposed at one of said first and second electrodes;
(b) a light transmissive second plate element disposed at the other of said first and second electrodes, said electrodes being disposed between said plate elements, said second plate element having a first surface adjacent to said electrode and a second surface more removed therefrom, said second plate element having a refractive index greater than that for said fluid;
(c) means for selectively moving said colloidal particles to positions adjacent to said second light transmissive plate element to produce light coupling between said cell element and said second plate element; and
(d) means for directing illumination to said second plate element, so that said illumination enters said second plate element and is totally internally reflected except for those positions at said first surface of said second plate element at which said particles are located.

4,218,303

COAL PYROLYSIS

Michael J. Finn; William R. Ladner, both of Cheltenham, and John O. H. Newman, Southam, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 19, 1978, Ser. No. 952,772
Claims priority, application United Kingdom, Nov. 8, 1977, 46384/77
Int. Cl.[2] C10G *1/00*; C10L *1/04*
U.S. Cl. 208—8 R **4 Claims**

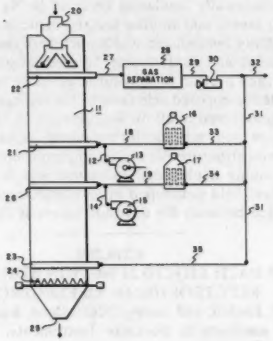
1. A process for the production of a liquid mononuclear aromatic which is one or more of benzene, toluene and xylene, which consist essentially of the steps of
(a) devolatilizing finely divided coal in the presence of substantially pure hydrogen, at a temperature of 750° to 950° K. and a pressure of 100 to 150 bar, in a first carbonization stage, and
(b) without cooling or condensation of the products of step (a), cracking the evolved volatiles in a second and non-catalytic stage in the presence of substantially pure hydrogen at a temperature of 1073° to 1173° K. and a pressure of 100 to 150 bar and
(c) quenching the products of step (b) to a temperature less than 875° K. and collecting the mononuclear aromatic liquid.

4,218,304

RETORTING HYDROCARBONACEOUS SOLIDS

Ralph E. Styring, Jr., Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 28, 1978, Ser. No. 973,834
Int. Cl.[2] C10G *1/00, 1/02*
U.S. Cl. 208—8 R **8 Claims**



1. A method of retorting of the hydrocarbonaceous matter in crushed mined hydrocarbonaceous solids comprising:
(a) feeding crushed mined hydrocarbon solids to a retort;
(b) heating at least one moving stream of a first gas to a temperature of at least 600° F., said first gas being at least partially comprised of gaseous hydrocarbons derived from retorting hydrocarbonaceous solids;
(c) mixing outside of said retort at least a portion of said first gas heated in step (b) with a second gas, said second gas being at least partially comprised of molecular oxygen and being at a temperature less than the temperature of said portion of said heated first gas, said second gas being in an amount which is less than the amount needed to supply enough oxygen to react with all of the hydrocarbons in said portion of said heated first gas and which is at least as great as the calculated amount needed to supply enough oxygen to raise the temperature of said portion of said heated first gas at least 100° F. when, for purposes of such calculation, it is assumed that all of the oxygen in said second gas reacts with hydrocarbons in said portion of said heated first gas;
(d) flowing at least a portion of the mixture produced in step (c) into said retort at at least one point; and
(e) operating said retort at a temperature of at least 700° F.

to convert a substantial portion of the hydrocarbonaceous matter in the retorted hydrocarbonaceous solids to gases and oil vapors.

4,218,305

EXTRUSION OIL COMPOSITION FOR CARBON ELECTRODE MANUFACTURE

Charles R. Gannon, and William R. Sawran, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jul. 17, 1978, Ser. No. 925,027
Int. Cl.[2] B28B *3/20*; C10M *1/04*
U.S. Cl. 208—14 4 Claims

1. An extrusion oil for use in preparing extruded carbonaceous aggregate mixtures comprising between about 45 and about 75 parts by weight per 100 parts of a mixture of straight-chain paraffinic hydrocarbons having an average number of carbon atoms per molecule of between about 16 and about 45 and a cylinder stock derived from crude petroleum.

4,218,306

METHOD FOR CATALYTIC CRACKING HEAVY OILS

Benjamin Gross, and Jong W. Lee, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,339
Int. Cl.[2] C10G *11/04*; B01J *8/24*
U.S. Cl. 208—120 8 Claims

1. In a riser cracking operation processing hydrocarbon feeds of different cracking characteristics, the method for producing high yields of gasoline boiling product which comprises,

passing a hydrocarbon feed comprising fresh atmospheric gas oil admixed with freshly regenerated crystalline zeolite catalyst as a suspension at an elevated cracking temperature upwardly through an initial portion of a riser conversion zone, for a contact time selected to particularly produce one of gasoline and distillate boiling product,

charging a second high coke producing hydrocarbon fraction selected from the group consisting of gas oil products of thermal cracking, heavy residual oil products of catalytic cracking and distress stocks comprising substantial amounts of polynuclear aromatics into said upwardly flowing suspension at a level from 10 to about 30 feet above the atmospheric gas oil charge level under conditions and at a temperature maintaining a riser conversion zone outlet temperature within the range of 900° F. to 1100° F., and

recovering an improved yield of gasoline product over that obtainable at the same outlet temperature by charging all of the hydrocarbon feeds to the bottom of the riser conversion zone.

4,218,307

HYDROCARBON CRACKING CATALYST

Carl V. McDaniel, Laurel, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 822,867, Aug. 8, 1977, abandoned, and a continuation-in-part of Ser. No. 741,326, Nov. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 571,177, Apr. 24, 1975, abandoned. This application Jan. 9, 1979, Ser. No. 2,139
Int. Cl.[2] C10G *11/02*; B01J *29/08*
U.S. Cl. 208—120 5 Claims

1. In an improved method for catalytically cracking hydrocarbons wherein the production of coke is minimized, the improvement comprising contacting a hydrocarbon feedstock with a catalyst comprising a catalytically active, coke selective zeolite admixed with an inorganic oxide matrix, and recovering cracked hydrocarbons of lower molecular weight, said zeolite being prepared by:

a. exchanging a sodium Y zeolite having a silica to alumina ratio of about 3.5 to 6 with an ammonium salt to reduce the Na_2O content thereof to less than 4 percent by weight;

b. exchanging said zeolite with a solution of rare earth ions to provide a rare earth content expresses as rare earth oxide of about 0.5 to 4 percent by weight;

c. washing said zeolite to remove excess salts;

d. heating said zeolite to a temperature of about 700° to 1600° F.;

e. contacting said zeolite with a dilute solution of a mineral acid to remove alumina therefrom and thereby increase the silica to alumina ratio to a range of about 7 to 20;

f. exchanging the zeolite of step e. with a solution of metal ions selected from the group consisting of rare earth and magnesium ions to provide a total metal ion content expressed as metal oxides of from about 1 to 10 percent by weight.

5. The method of claim 1 wherein said zeolite contains about 1.5 percent by weight rare-earth oxide and about 1 percent by weight magnesium oxide.

4,218,308

HYDROGENATION CATALYST

Takuji Itoh, Sayama, and Ikuo Akitsuki, Ohi, both of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 690,265, May 26, 1976, abandoned, which is a division of Ser. No. 607,091, Aug. 22, 1975, abandoned. This application Jan. 29, 1979, Ser. No. 7,140
Int. Cl.[2] C10G *23/04*
U.S. Cl. 208—143 8 Claims

1. A process for hydrogenating aromatic compounds present in hydrocarbon oils comprising contacting said oil, at a temperature of from 200°–300° C., with hydrogen and a catalyst containing a catalytic metal or compound thereof comprising at least one noble metal component of Group VIII of the Periodic Table supported on a porous silica/alumina carrier having a specific surface area of at least about 200 m^2/g and a bulk density of less than about 0.6 g/ml and wherein the silica content of the carrier ranges between about 5 to 40% by weight of the carrier and further characterized in that:

(a) pores having a diameter smaller than 600 Å occupy at least 90% of the total pore volume, but less than 100% of the total pore volume;

(b) pores having a diameter of from 150 to 600 Å occupy at least about 50% of the total volume of the pores having a diameter smaller than 600 Å; and

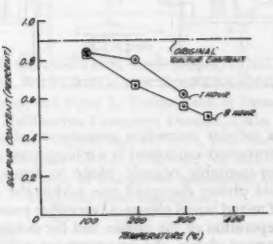
(c) recovering an oil of reduced aromatic content.

4,218,309

REMOVAL OF SULFUR FROM SHALE OIL

Leslie E. Compton, Claremont, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Sep. 8, 1978, Ser. No. 940,867
Int. Cl.[2] C10G *31/06*
U.S. Cl. 208—208 R 22 Claims



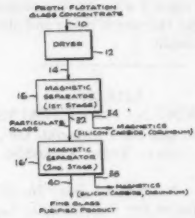
16. A method for reducing the sulfur content of crude shale oil comprising the step of maintaining the crude shale oil at a

temperature above about 100° C. in the substantial absence of added reagent, and below the thermal decomposition temperature of shale oil for a sufficient time to evolve substantially non-condensible sulfur-containing gas from such shale oil for lowering the sulfur content of the shale oil.

4,218,310
PUPIFICATION OF PARTICULATE GLASS BY MAG SEPARATION OF IMPURITIES

Booker W. Morey, Pasadena, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Aug. 31, 1977, Ser. No. 829,439
Int. Cl.² B03C *1/26*
U.S. Cl. 209—214 **14 Claims**



1. A process for the separation of impurities selected from the group consisting of aluminum oxide and silicon carbide stones, and mixtures thereof, from a dried froth floated particulate glass concentrate, which comprises the steps of:

(a) subjecting said particulate glass concentrate containing a minor portion of said impurities by weight to high intensity dry induced roll magnetic separation,

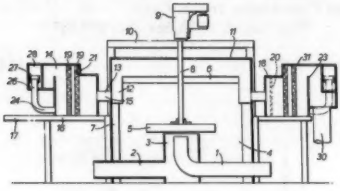
(b) separating the preponderant amount of said portion as magnetics from said particulate glass concentrate, and

(c) recovering said particulate glass concentrate having a substantially reduced content of said impurities and suitable as a glass cullet.

4,218,311
SOLVENT EXTRACTOR

George M. Newrick, Lindfield, England, assignor to Davy International (Oil & Chemicals) Limited, London, England

Filed Mar. 31, 1975, Ser. No. 565,741
Claims priority, application United Kingdom, May 2, 1974, 19266/74
Int. Cl.² B01D *11/04, 13/00*
U.S. Cl. 210—21 **16 Claims**



13. In a solvent extraction process in which an aqueous phase is contracted and mixed in a mixing zone with a substantially water-insoluble organic phase to form a material of mixed liquid phases dispersed one within the other, and the material of mixed liquid phases is thereafter passed to a settling zone for separation of the phases and for continuous removal of the separated phases, the improvement comprising supplying the aqueous and organic phases to the mixing zone, mixing the aqueous and organic phases in said mixing zone, causing resulting material of mixed liquid phases to flow radially outward from the mixing zone into a plurality of separate settling zones positioned adjacently around said mixing zone, each of said plurality of settling zones having an inlet end adjacent to and in flow communication with the mixing zone, the flow of resulting material of mixed liquid phases into each of said plurality of settling zone being capable of control or shut-off, and causing said material of mixed liquid phases to flow from said mixing zone into a plurality of said settling zones in which flow communication with said mixing zone is not shut-off, the flow in said settling zones being radially outward with respect to said mixing zone and towards a part of said settling zones remote from the inlet end, through one or more coalescer units positioned to receive liquid from its inlet end and extending transversely across the liquid flow through the said settling zone, whereby material of said mixed liquid phases is caused to flow through the coalescer units of said settling zones which are in flow communication with said mixing zone to coalesce droplets of the dispersed phase, and continuously removing on the downstream side of the coalescer units the separated phases from the settling zones which are in flow communication with said mixing zone.

4,218,312
MEMBRANE SEPARATION OF ORGANICS FROM AQUEOUS SOLUTIONS

Eli Perry, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 1, 1975, Ser. No. 636,400
Int. Cl.² B01D *13/00*
U.S. Cl. 210—22 C **3 Claims**

1. A process for separating neutral organics from an aqueous solution comprising: contacting an aqueous solution containing neutral organics having at least about four carbon atoms per molecule selected from the group consisting of alkanols, alkyl benzenes and organic nitriles with a first surface of a hydrophobic polymeric membrane comprised of an aliphatic nylon selectively permeable to the neutral organic components contained in the aqueous solution, maintaining a second and opposite membrane surface at a lower chemical potential than the first membrane surface for the neutral organic components, permeating a portion of the neutral organic components into and through the membrane, and withdrawing at the second membrane surface a vapor mixture having a higher total concentration of said neutral organic components than the total concentration of said neutral organic components in the aqueous solution contacting said first surface.

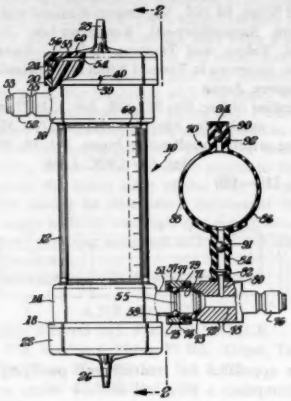
4,218,313
DIALYSIS APPARATUS AND TECHNIQUE

James D. Aid, St. Petersburg, Fla., and Kyu H. Lee, King of Prussia, Pa., assignors to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Continuation-in-part of Ser. No. 799,582, May 23, 1977, abandoned. This application Aug. 25, 1977, Ser. No. 827,565
Int. Cl.² B01D *3/00, 13/00*
U.S. Cl. 210—22 A **6 Claims**

2. In the process of measuring the rate of ultrafiltration in a dialysis unit containing a dialysis chamber, the improvement according to which the dialysis unit is tiltable, there is incorporated in that unit an externally viewable vertically positionable dialyzate flow passageway downstream and in series with the dialysis chamber to carry off the entire dialyzate outflow from that chamber, said dialyzate flow passageway being sufficiently narrow and empty to enable accurate reading of the level of liquid moving through it, circulating through the unit a liquid to be dialyzed, introducing dialyzate into the dialyzate section of the dialysis chamber and into said dialyzate flow passageway to partially fill that passageway with the dialyzate, terminating said dialyzate introduction, holding the unit with

that passageway generally vertical so that the liquid level in the partially filled passageway moves downstream along the



length of the passageway as ultrafiltration takes place from the liquid to be dialyzed, and timing the movement of that level.

4,218,314

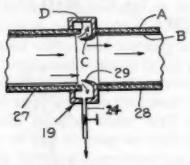
HYPERFILTRATION SCOOP APPARATUS AND METHOD

James P. Schubert, 207 Willow Springs Rd., and Donald K. Todd, Booker Springs Rd., both of Clemson, S.C. 29631

Filed Jul. 20, 1978, Ser. No. 926,499

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 H **7 Claims**



1. For use in a hyperfiltration apparatus for increasing the concentration of an effluent from a fluid treatment process, the improvement comprising:

a permeable tubular structural support member;

a membrane supported by said tubular structural support member extending along said member internally thereof presenting an open elongated flow path;

an opening in said membrane intermediate the ends of said member;

an opening in said support member in register with said opening in said membrane for flow of boundary layer fluid therethrough; and

means for collecting boundary layer fluid passing through said openings;

whereby the fluid flow very near a membrane fluid interface is highly concentrated and may be removed as a concentrate through said openings for collection.

4,218,315

OXIDATION AND ADSORPTION METHOD FOR REMOVING CONTAMINATING SUBSTANCES FROM LIQUIDS

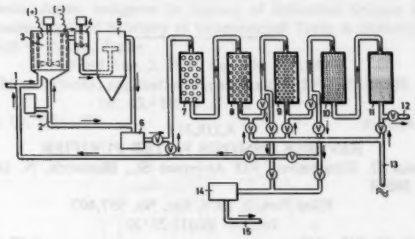
Karl H. Hartkorn, Heinrich-Zille. Strasse 37, 6085 Nauheim, Fed. Rep. of Germany

Continuation of Ser. No. 770,387, Feb. 22, 1977, abandoned, which is a continuation of Ser. No. 597,978, Jul. 22, 1975, abandoned. This application Sep. 11, 1978, Ser. No. 941,020

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1974, 2436498

Int. Cl.[2] C02B *1/10, 1/14, 1/36*

U.S. Cl. 210—26 **4 Claims**



1. A process for removing contaminating materials from a polluted aqueous liquid, said contaminating materials including solid contaminants, ranging in size from suspended solids in the macrorange through colloids and dissolved organic contaminants, which comprises the steps of:

(a) adding a predetermined amount of NaOCl solution to said liquid, forming a mixture;

(b) electrolyzing said mixture to coagulate at least some of said contaminants into a sludge and to form OCl^- ions capable of oxidizing said contaminants;

(c) separating the sludge from said mixture, said remaining mixture containing dissolved organic contaminants and residual OCl^- ions, said predetermined amount of NaOCl solution being at least adequate to yield said residual OCl^- ions;

(d) adding ozone to said remaining mixture to oxidize said dissolved organic contaminants to form CO_2 and an oxidation residue;

(e) contacting said remaining mixture with particles of an inorganic solid adsorbent by percolating said remaining mixture through a column containing a bed of said adsorbent so as to oxidize said contaminants with said residual OCl^- ions and said ozone;

(f) adsorbing the oxidation residue from said remaining mixture on said inorganic solid adsorbent while venting and collecting the CO_2;

(g) regenerating said inorganic adsorbent by flushing with the collected CO_2; and

(h) collecting the decontaminated aqueous liquid after percolation through said inorganic adsorbent bed.

4,218,316

METHOD OF CLARIFYING AND REMOVING WATER FROM WATER-SOLIDS SUSPENSIONS

Jimmie L. Watson, and Patsy L. Totten, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 706,104, Jul. 16, 1976, Pat. No. 4,127,482. This application Apr. 3, 1978, Ser. No. 892,726

The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—51 **7 Claims**

1. A method of clarifying and removing water from a sump containing water aqueous waste drilling fluid having clay solids suspended therein, comprising the steps of dispersing at

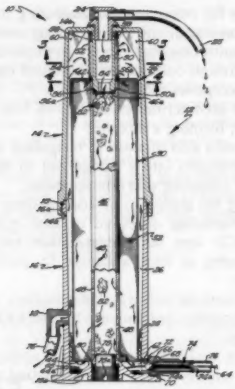
least one aqueous solids flocculating additive into said water-solids suspension in an amount sufficient to form said suspended solids into flocculent masses of a size in the range of from about 0.1 to about 0.4 centimeters in diameter; placing a screen attached to a suction means in said sump near the bottom with said screen having a mesh size in the range of from about 10 to about 20 mesh (U.S. sieve series) which prevents said flocculent masses from passing therethrough; withdrawing by suction means water from near the bottom of said sump through said screen without removing said flocculent masses; and removing substantially all of said water from said flocculent masses before disposing of said flocculated solids.

4,218,317

REVERSE OSMOSIS WATER PURIFIER

John D. Kirschmann, 933 Anderson St., Bismarck, N. Dak. 58501

Filed Nov. 2, 1978, Ser. No. 957,407
Int. Cl.[2] B01D *23/20*
U.S. Cl. 210—117 **9 Claims**



1. A water purification device utilizing a reverse osmosis membrane assembly; the device having an inlet for connection to a source of pressurized feed water to be purified and an outlet for flush water, and whereby said reverse osmosis membrane assembly requires water pressure in a predetermined range for proper operation wherein the improvement comprises an outlet restrictor for regulating and restricting the flow of flush water from said device, said restrictor comprising:

a piece of capillary tubing, said piece being of a length and internal diameter sufficient to restrict the flow of flush water so as to maintain the water pressure in said predetermined range;

a ball check valve comprising a ball and corresponding seat arranged so that flow of water from said device will tend to force said valve closed wherein said capillary tubing passes through said ball and is sealed thereto such that when said device is pressurized during operation, said ball is forced against said seat so that all flush water exits through said capillary tube thereby maintaining said predetermined pressure range; and

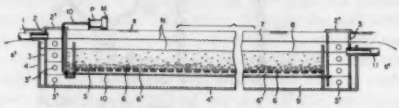
means for opening said check valve for flushing said device of impurities.

4,218,318

PROCESS AND APPARATUS FOR TREATING AND PURIFYING WASTE WATER

Tadashi Niimi, 88-104,, Sagamiono-Kodan-Jutaku, 3897, Kamitsuruma, Sagamihara-shi, Kanagawa-ken, Japan; Masanori Niimi, Tokyo, and Tsutomu Arimizu, Kokubunji, both of Japan, assignors to Tadashi Niimi and Masaaki Niimi, both of Kanagawa, Japan

Continuation of Ser. No. 812,425, Jul. 1, 1977, abandoned. This application May 4, 1979, Ser. No. 35,833
Claims priority, application Japan, Jul. 16, 1976, 51-83940
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—150 **1 Claim**



1. An apparatus for treating and purifying waste water, which comprises a long and shallow waste water treatment tank having an opening at the upper end thereof and being filled with sand gravel covered with a convex net covered with aerated soil, said tank being positioned dozens of centimeters below the soil surface, and being provided with:

(1) an inlet for waste water,

(2) a conduit in the base of said tank connected to said inlet,

(3) perforated plates overlaying said conduit and supporting said sand gravel filling said tank,

(4) a perforated pipe for supplying air arranged under the perforated plates, and

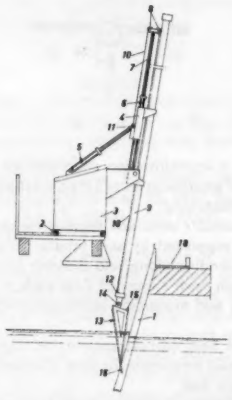
(5) an outlet for treated waste water at the surface of the sand gravel covered with said convex net.

4,218,319

METHOD AND A DEVICE FOR AUTOMATIC CLEANING OF TRASHRACKS AT WATER INTAKES FOR WATER POWER PLANTS AND SIMILAR

Hans Hansson, Mölneby. Basgarden, Överlida, Sweden (510 60)

Filed Feb. 2, 1979, Ser. No. 9,048
Claims priority, application Sweden, Feb. 10, 1978, 7801549
Int. Cl.[2] B01D *35/16*
U.S. Cl. 210—159 **3 Claims**



1. A device for automatic cleaning of trashracks at turbine intakes, fresh water intakes, waste water purifying plants and the like, said device comprising a support arranged above the trashrack and being moveable sideways in parallel with the

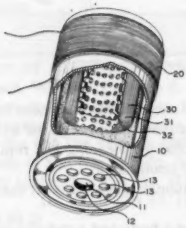
trashrack, said support upholding a rake arm, a substantially wedge-shaped rake pivotally mounted at the lower end of the rake arm, said rake having scraping members at its upper and lower edges facing the trashrack, drive means on said support arranged to move the rake arm with the rake from a position above the water surface to a position at the lower end of said trashrack, then to press the rake against the trashrack and move it upwards along the trashrack with the upper scraping member of the wedge-shaped rake facing the trashrack in sliding engagement with the bars of said trashrack to an emptying position above the trashrack, said rake arm transferrng pulling and pushing forces from the drive means to the rake, and means to pivot the lower edge of the rake towards the trashrack so that during its downward movement the rake makes an acute angle with the trashrack and engages the trashrack with its lower scraping members and pushes away trash gathered at the trashrack.

4,218,320

LUBRICATING OIL FILTER DEVICE

Sung M. Liaw, 379, Section 4, Hsing Yi Rd., Taipei, Taiwan

Filed Jan. 31, 1979, Ser. No. 8,175
Int. Cl.[2] B01D *31/06*
U.S. Cl. 210—223 **1 Claim**



1. A lubricating oil filter device comprising:

a cylindrical housing through which lubricating oil passes, said housing having an outer wall which is impermeable to lubricating oil and which is formed of a material which can be magnetized, said housing having an inlet defined therein and an outlet defined therein, said inlet and outlet being positioned so that lubricating oil flows longitudinally of said housing in passing through said housing;

a filter medium located within said housing so that lubricating oil passing through said housing flows parallel to said housing outer wall for a substantial portion of the length of said outer wall and flows so that such lubricating oil flows between said housing outer wall and said filter medium coaxially of said housing as well as through said filter medium, said filter medium removing particles from lubricating oil passing through said housing;

removing means for removing fine iron particles from lubricating oil passing through said housing, said removing means including an electric winding wound around the outside of said housing, means for connecting said winding to an electric system of an automobile to be energized thereby, said energized winding magnetizing said housing to attract fine iron particles to said housing outer wall, said removing means further including a hollow metal column located inside said filter medium, said metal column being dimensioned and designed for supporting said filter medium and being formed of material which can be magnetized and having a multiplicity of holes defined therein through which lubricating oil can pass, said column being magnetized by said energized winding to attract any iron particles still remaining in lubricating oil after such lubricating oil has passed through said filter medium;

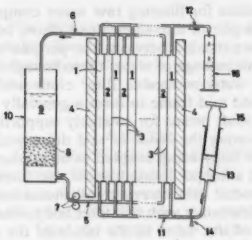
said electric winding magnetizing said housing outer wall and said column in a manner such that most of the fine iron particles in lubricating oil passing longitudinally through said housing are attracted to said housing outer wall to form a coating on said housing outer wall, said energized winding magnetizing said coating so that further fine iron particles will be separated from lubricating oil passing through said housing and will be attracted to said coating whereby fine iron particles are removed from lubricating oil passing through said housing by said magnetized housing outer wall, said magnetized coating, said filter medium and said magnetized column.

4,218,321

DEVICE FOR REMOVAL OF EXCESS WATER FROM BLOOD

Kanji Sasaki; Tetsuro Suehiro, and Akira Okada, all of Yokohama, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Aug. 2, 1978, Ser. No. 930,159
Claims priority, application Japan, Aug. 5, 1977, 52-93995
Int. Cl.[2] B01D *31/00, 15/00*
U.S. Cl. 210—259 **6 Claims**



1. A device for the removal of excess water contained in the blood by utilization of osmotic pressure, which device comprises in combination:

a plurality of solution chambers possessed of one feed inlet connected to all of said solution chambers, said feed inlet having a pinch cock, and one constantly open discharge outlet connected to all of said solution chambers;

water suction means disposed inside said plurality of solution chambers for removing the excess water in the blood, said water suction means being a high concentration solution containing a concentration of 3.7-6 mol/liter solutes comprising calcium chloride, and one from the group consisting of glucose and sucrose,

said pinch cock permitting the passage of a fresh high concentration solution through said feed inlet into said plurality of solution chambers and thereby allowing the discharge of said high concentration solution in said plurality of solution chambers out of said discharge outlet when said pinch cock is opened;

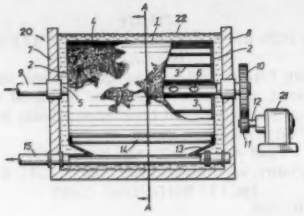
a plurality of blood chambers allowing the blood subjected to perfusion treatment to pass therethrough, said solution chambers and said blood chambers being alternately disposed; and

a plurality of normal osmotic semi-permeable membranes inserted to partition the adjoining ones of the alternately disposed chambers, said semi-permeable membranes exhibiting solute permeability for said solutions in the range of from 1×10^{-7} cm/min. to 7×10^{-6} cm/min. at the time said semi-permeable membranes have come into contact with said high concentration solution at one side thereof and with the blood at the other side thereof, whereby the excess water contained in the blood is allowed to pass through said semi-permeable membranes by osmotic pressure into said solution chambers and said solutes contained in said high concentration solution are prevented from passing through said semi-permeable membranes into said blood chambers.

4,218,322
WATER FILTRATION APPARATUS

Sadao Kojima, Hachiogi, Japan, assignor to Kosaku Iida, Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,441
Claims priority, application Japan, Apr. 11, 1975, 50-44485
Int. Cl.[2] B01D *33/10*
U.S. Cl. 210—391 10 Claims

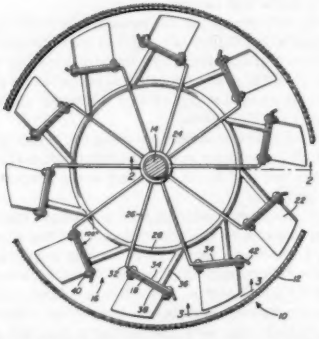


1. An apparatus for filtering raw water comprising a drum composed of a pair of disc-shaped end plates, horizontal connecting means extended between the peripheries of the end plates to permit passage of water therethrough and to form a frame, and a water-permeable filter cloth with a long pile wrapped around said frame to form a generally drum-shaped filter body, a shaft means for rotatably supporting said drum and communicating the inside of said drum with a discharge pipe, said filter body being adapted to be submerged in a raw water conduit, a hopper located below said filter body in said raw water conduit and carrying roll means on its opposite upper edges for contact with said filter body, means for directing a portion of the water in the inside of the drum to said hopper through a part of said filter cloth and a drain pipe means connected to the hopper for conveying away solids which are discharged from said filter body into said hopper.

4,218,323
PELLET FREE ROTOR FOR CENTRIFUGAL PELLET DRYERS

David A. McCracken, Winfield, W. Va., assignor to Gala Industries, Inc., Eagle Rock, Va.

Filed Aug. 9, 1978, Ser. No. 932,336
Int. Cl.[2] B01D *29/00*
U.S. Cl. 210—415 13 Claims

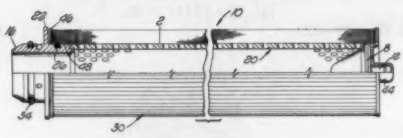


13. In a pellet drying apparatus having a vertical cylindrical housing made of foraminous material through which water is discharged by rotation of a rotor assembly enclosed therein, said rotor assembly enclosed therein, said rotor assembly comprising lifter blade means for impelling pellets vertically upward through the housing, a power shaft, and spider means secured to the power shaft for support of the blade means within the housing, said spider means including a plurality of radial spokes secured to the power shaft, an attachment arm extending from each of the spokes in one directional sense only at an obtuse angle in a horizontal plane perpendicular to said power shaft, fastener means for securing the blade means to said attachment arms and stabilizer means interconnecting said spokes radially between the power shaft and the attachment arms for holding the spokes aligned with said horizontal plane in fixed angularly spaced relation to each other.

4,218,324
FILTER ELEMENT HAVING REMOVABLE FILTER MEDIA MEMBER

Wilhelm U. Hartmann, Sepulveda; Larry C. Augustine, Saugus, both of Calif., and Daniel J. Ryan, Tuckerton, N.J., assignors to Textron, Inc., Providence, R.I.

Filed May 3, 1979, Ser. No. 35,670
Int. Cl.[2] B01D *27/06, 29/06*
U.S. Cl. 210—493 R 13 Claims



1. A stainless steel metallic filter element for filtering corrosive materials at relatively high pressures which element may be readily disassembled for cleaning and replacement of component parts thereof comprising:

(A) a perforated tubular metal support member having one end closed;

(B) a fitting having a body and a radially outwardly extending flange permanently attached to the other end of said support member;

(C) a tubular pleated filter media member formed of stainless steel metallic material slipped over and extending along the length of said support member and in close contact therewith but with no physical retention means between said one diameter and said support member; and

(D) means for removably sealing said media member to said support member.

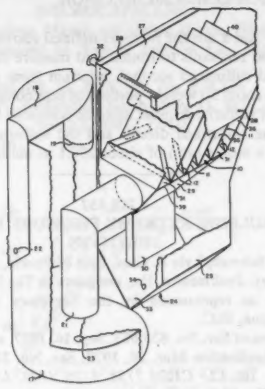
4,218,325
APPARATUS FOR SEPARATION OF SUSPENSIONS

Edward J. McMullin, Jr., 3165 Decatur Ave., Bronx, N.Y. 10467

Filed Jan. 29, 1979, Ser. No. 7,272
Int. Cl.[2] B01D *21/02*
U.S. Cl. 210—521 12 Claims

1. In a separator for separating a contaminant from a liquid by sedimentation or floatation for separation of the contaminant from the liquid, comprising a plate stack including a plurality of spaced plates inclined to the vertical and disposed in a generally parallel array providing lower and upper plate stack ends, first conduit means for introducing the liquid containing the contaminant into the plate stack at one of said ends for travel of the liquid through the plate stack to the other of said ends and travel of said contaminant to the end of the plate stack to which the liquid containing contaminant is introduced for the sedimentation or floatation and the separation, second conduit means for withdrawing the separated liquid, and housing means for confining flow of the liquid from the first conduit means to the second conduit means to passage through the plate stack, the improvement which means for directing the incoming liquid containing contaminant so as to provide a zone of reduced velocity in the area adjacent the downstream side

of the baffles such that the contaminant slides down the plates at an increased rate said means for directing consisting essentially of baffle means disposed between the plates adjacent the first conduit means.



4,218,326

PRODUCTION OF NITROGEN-RICH GAS MIXTURES

William B. Crouch, Whittier; Carolina Z. Posadas nee Fabiero, Roland Heights, and Allen M. Robin, Anaheim, all of Calif., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 801,138, May 27, 1977, Pat. No. 4,119,566, which is a division of Ser. No. 617,601, Sep. 29, 1975, Pat. No. 4,057,510. This application Mar. 31, 1978, Ser. No. 892,225
Int. Cl.[2] E21B *43/16*
U.S. Cl. 252—8.55 D 4 Claims

1. An oil recovery process comprising, reacting by partial oxidation a hydrocarbonaceous feedstock selected from the group consisting of hydrocarbonaceous fuel, liquid oxygenated hydrocarbonaceous material, and mixtures thereof with air and optionally in the presence of a supplemental temperature moderator in the reaction zone of a free-flow, noncatalytic, unpacked, refractory lined gas generator at a pressure in the range of about 1 to 250 atmospheres and a temperature in the range of about 1300° to 3000° F., wherein said hydrocarbonaceous feedstock contains substantially no metals nor non-combustible materials and supplemental H_2O is introduced into the reaction zone in the range of nil to 1.0 pounds of H_2O per pound of fuel, and wherein the O/C atomic ratio is in the range of 2 to 3.8 when said hydrocarbonaceous feedstock is a gaseous hydrocarbonaceous fuel, and in the range of about 2 to 2.8 when said hydrocarbonaceous feedstock is a liquid hydrocarbonaceous fuel or liquid oxygenated hydrocarbonaceous material; producing a nitrogen rich effluent gas mixture comprising N_2, A and CO_2, and containing at least one gas from the group H_2, CO, H_2O, COS and H_2S, and being free from particulate carbon, free-oxygen and nitrogen oxides; and introducing said effluent gas mixture into an oil formation for the recovery of oil.

4,218,327

STABILIZING THE VISCOSITY OF AN AQUEOUS SOLUTION OF POLYSACCHARIDE POLYMER

Scott L. Wellington, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 673,518, Apr. 5, 1976, abandoned. This application May 5, 1978, Ser. No. 903,279
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—8.55 D 16 Claims

1. In an oil recovery process in which an aqueous solution which is thickened with a water-soluble Xanthan gum polymer is prepared in a surface location and injected into a subsurface reservoir, an improved process for preparing the thickened aqueous solution which comprises:

first treating an aqueous liquid to remove substantially all dissolved oxygen; and, subsequently

adding to the deoxygenated aqueous liquid at least one water-soluble sulfur containing antioxidant which is capable of protecting a Xanthan gum polymer solution from drastic loss of viscosity due to being boiled at substantially atmospheric pressure for about five minutes;

adding to the deoxygenated aqueous liquid at least one water-soluble readily oxidizable alcohol or glycol which is capable of protecting a Xanthan gum polymer solution from drastic loss of viscosity due to being boiled at substantially atmospheric pressure for about five minutes;

each of said capabilities of protecting the Xanthan gum polymer solutions being demonstrable by the protecting of the viscosity of a water solution, which solution contains 800 ppm of each of the additives being tested, Xanthan gum polymer, sodium chloride and a sulfite group-containing oxygen scavenger, with said solution being protected to the extent that at least about 75% of the viscosity exhibited before the boiling is exhibited after the boiling; and

adding to the deoxygenated aqueous liquid at least one water-soluble Xanthan gum polymer produced by the fermentation of carbohydrates by a bacteria of the genus Xanthomonas.

4,218,328

LUBRICATING OIL ADDITIVE

Ronald J. Vaughan, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1978, Ser. No. 973,871
Int. Cl.[2] C10M *1/32, 1/40*
U.S. Cl. 252—33.3 19 Claims

1. A process for the preparation of a lubricating oil additive which comprises contacting under reaction conditions a mixture of an amino acid and a basically reacting metal compound, said contacting taking place in the presence of a solvent and at least one suspending agent for said basically reacting metal compound and in the presence of a hydroxylic promoter, said reaction conditions including a temperature from the freezing point to the boiling point of the mixture and based on one equivalent of the basically reacting metallic compound from 0.1 to 2.0 equivalents of the amino acid and from 2 to 20 parts by weight of the suspending agent per part of the basically reacting metal compound.

4,218,329

COOLING AND LUBRICATING FLUID FOR METAL WORKING

Kook-Wha Koh, 2461 Wickfield Dr., West Bloomfield, Mich. 48033

Filed Aug. 28, 1978, Ser. No. 937,404
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—46.4 11 Claims

1. An aqueous cooling and lubricating fluid for metal cutting and fabricating operations comprising:

(a) from about 0.1 parts to about 10 parts of an inorganic corrosion inhibitor selected from the group consisting of water-soluble salts of molybdate;

(b) from about 1 part to about 70 parts of an organic corrosion inhibitor selected from the group consisting of water soluble reaction products of an aromatic sulfonamidocarboxylic acid and an amine;

(c) from about 5 parts to about 50 parts of an organic corrosion inhibitor selected from the group consisting of water-soluble amines and mixtures thereof;

(d) from about 0.3 to about 10 parts of morpholine;

(e) from about 0.1 part to about 10 parts of a metal deactivator; and

(f) from about 0.1 part to about 15 parts of a coupling agent.

4,218,330
LUBRICANT

Ronald L. Shubkin, West Bloomfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 26, 1978, Ser. No. 919,265
Int. Cl.[2] C10M *1/48, 1/16*
U.S. Cl. 252—46.6 **18 Claims**

1. A hydrogenated olefin oligomer consisting mainly of dimers of C_{12-18} predominantly alpha olefins having a viscosity above about 3.0 cs at 100° C., a pour point below 0° C. and low volatility such that less than 25 weight percent evaporates after two hours at 204° C., said oligomer being suitable for use in crankcase lubricants for internal combustion engines, said oligomer being made by the process comprising contacting a C_{12-18} predominantly alpha olefin or mixture thereof, with the proviso that the average carbon number of said olefin or mixture thereof is at least 13, with a Friedel-Crafts catalyst at a temperature of about 20°–200° C. until the reaction mixture excluding monomer is predominantly dimer, distilling to remove monomer and hydrogenating.

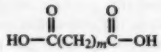
15. A formulated crankcase lubricating oil composition comprising a hydrogenated dimer oligomer of claim 1, an alkaline earth metal sulfonate and an ashless dispersant selected from the group consisting of alkenylsuccinimides of polyalkylene polyamines, Mannich condensation products or alkylphenols, aldehydes and reactive amines and alkaline succinic acid esters of alkanepolyols.

4,218,331
EXTREME PRESSURE LUBRICATING COMPOSITIONS

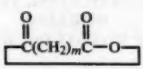
John D. Bacha, Monroeville, Pa., and Robert W. Hill, Houston, Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 24, 1978, Ser. No. 927,458
Int. Cl.[2] C10M *1/26, 1/38*
U.S. Cl. 252—48.6 **15 Claims**

1. An extreme pressure, anti-wear lubrication composition consisting essentially of a major amount of a lubrication oil and a minor amount of an extreme pressure, anti-wear additive consisting essentially of a mixture of a sulfurized diester and sulfurized alcohol, said additive having been obtained by reacting a dicarboxylic acid of the formula:



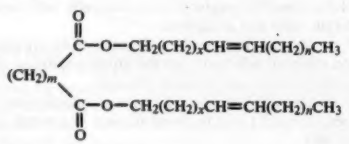
wherein m is an integer of from about 1 to about 10, or a dicarboxylic acid anhydride of the formula:



wherein m is defined above with a linear unsaturated alcohol of the formula:

$$CH_3(CH_2)_nCH{=}CH(CH_2)_xCH_2OH$$

wherein n is an integer of from about 5 to about 15, and x is an integer of from about 4 to about 11, resulting in a diester defined by the formula:



wherein m, n and x are as defined above, combining said diester with a linear alcohol of the formula:

$$CH_3(CH_2)_nCH{=}CH(CH_2)_xCH_2OH$$

wherein n and x are the integers defined above and sulfur and heating said reactants to obtain said mixture of a desulfurized diester and sulfurized alcohol, wherein from about 6 weight percent to about 20 weight percent of said combined sulfurized diester and sulfurized linear alcohol comprise the sulfide moiety and the sulfurized diester and the sulfurized alcohol are present in a molar ratio of about 200:1 to about 2:1.

4,218,332
TETRASULFIDE EXTREME PRESSURE LUBRICANT ADDITIVES

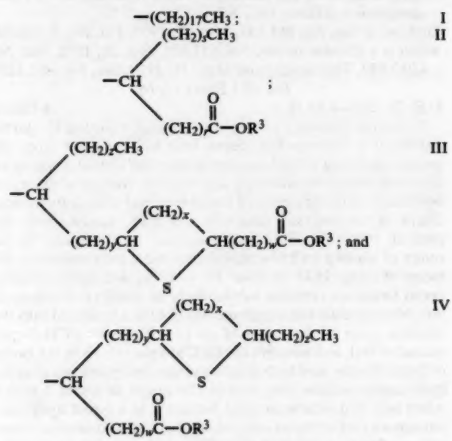
Arthur W. Schwab; Lyle E. Gast, both of Peoria, Ill., and Harold E. Kenney, Jenkintown, Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 833,883, Sep. 16, 1977, abandoned. This application Mar. 20, 1979, Ser. No. 22,128
Int. Cl.[2] C10M *1/38, 1/26, 1/24, 3/32*
U.S. Cl. 252—48.6 **8 Claims**

1. Tetrasulfide compounds having the structural formula:

$$R^1{-}S{-}S{-}S{-}S{-}R^2$$

wherein R^1 and R^2 are each independently selected from the following substituent groups:

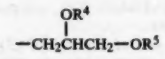


wherein R^1 and R^2 are not both $-(CH_2)_{17}CH_3$;

wherein r and s are each in the range of 4–10 with the proviso that $r+s=15$;

wherein w and y are each in the range of 1–8, x is 2 or 3, and z is in the range of 0–8, with the proviso that $w+x+y+z=13$; and

wherein R^3 is hydrogen; C_1–C_5 straight or branched alkyl; or

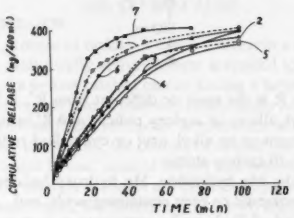


wherein R^4 and R^5 are each independently selected from the acyl radicals or C_{16}–C_{18} saturated and unsaturated fatty acids, and from the acyl radicals of the mercapto, thiolan, and thiane derivatives of C_{18} unsaturated fatty acids.

4,218,333
PROCESS FOR THE PREPARATION OF PHARMACEUTICAL SUBSTANCE-CONTAINING MICROCAPSULES

Masayoshi Samejima, Minoh, and Goichi Hirata, Hirakata, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jul. 31, 1978, Ser. No. 929,224
Claims priority, application Japan, Aug. 11, 1977, 52-96749
Int. Cl.² B01J *13/02*
U.S. Cl. 252—316 **8 Claims**



1. A process for the preparation of microcapsules containing a pharmaceutical substance which comprises dissolving

a mixture of a first ethyl cellulose having a viscosity of about 90 to 110 cps and a second ethyl cellulose having a viscosity lower by at least about 40 cps than the viscosity of the first ethyl cellulose, the weight ratio of said first ethyl cellulose to said second ethyl cellulose being in the range of from about 0.1 to about 10;

and polyisobutylene having an average molecular weight of about 8,000 to about 140,000;

in a solvent to form a solution thereof, said ethyl cellulose mixture having an ethoxy content of about 48 to about 49.5% by weight.

dispersing a powder of a pharmaceutical substance in said solution to form a dispersion;

cooling said dispersion; and

separating the thereby formed microcapsules containing said pharmaceutical substance from said dispersion.

4,218,334
PHYTOSTEROL BLENDS

Larry D. Lundmark, Richfield, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Jun. 6, 1975, Ser. No. 584,319
Int. Cl.² B01F *17/00, 17/38*
U.S. Cl. 252—356 **6 Claims**

1. A blend consisting essentially of from about 10 to 50 percent phytosterol and from about 50 to 90 percent of a member of the group consisting of free saturated fatty acids and free saturated fatty alcohols having an even number of carbon atoms from 12 to 18 in number, said blend being substantially free of triglyceride.

4,218,335
STABILIZER FOR AN IMMUNOCHEMICAL MEASURING REAGENT

Ei Mochida, Tokyo, and Nobuhisa Ogawa, Omiya, both of Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1978, Ser. No. 960,639
Claims priority, application Japan, Nov. 29, 1977, 52/142925
Int. Cl.² G01N *33/16, 31/02*
U.S. Cl. 252—408 **15 Claims**

5. A stabilizer for immunochemical measuring reagents consisting of a buffer solution and a solution obtained by heating a solution containing cytochrome c and sodium azide at 100°–130° C. for 2–8 hours in an autoclave and removing the produced coagulated substance.

13. An immunochemical measuring reagent consisting of carrier particles adsorbed with antigen or antibody, the immunochemical measuring reagent being stabilized by the presence of a buffered solution containing cytochrome c and sodium azide.

4,218,336
PROCESS FOR THE SEPARATION OF TRIPHENYLPHOSPHINE RHODIUM HALIDE CATALYSTS

Dieter Eisenbach, Riedstadt, and Werner Gosewinkel, Hirschberg-Groszsachsen, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 947,293
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1977, 2745662
Int. Cl.² B01J *31/40, 31/24, 23/96;* C07B *1/00*
U.S. Cl. 252—411 R **9 Claims**

1. A process for the separation of a triphenylphosphine rhodium halide catalyst from a polar, organic solution which contains other substances hydrogenated by means of homogeneous catalysts and hydrogen, comprising adding to the solution a solid adsorption agent and a reducing agent with a redox potential of less than about −0.1 volt, allowing the mixture to react and, after completion of the reaction, separating the adsorption agent with the adsorbed rhodium from the solution.

2. A process according to claim 1, wherein the adsorption agent used is active charcoal, silica gel, aluminum oxide, cellulose, a cellulose derivative or asbestos.

3. A process according to claim 1, wherein the reducing agent is aluminum, iron, tin or zinc powder.

4,218,337
PASSIVATING METALS ON CRACKING CATALYSTS WITH TELLURIUM

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 886,030, Mar. 13, 1978, Pat. No. 4,169,042. This application Mar. 8, 1979, Ser. No. 18,690
Int. Cl.² B01J *27/30, 27/02;* C10G *11/02;* B01J *29/38*
U.S. Cl. 252—411 R **5 Claims**

1. A process for passivating metals selected from the group consisting of nickel, iron and vanadium on a used cracking catalyst which comprises contacting said used cracking catalyst having at least one of said metals thereon with at least one treating agent selected from the group consisting of elemental tellurium, oxides of tellurium and compounds convertible to elemental tellurium or oxide thereof during cracking or catalyst regeneration whereby there is added to said cracking catalyst a modifying amount of said treating agent.

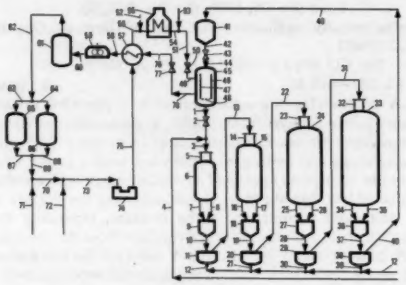
4,218,338
PROCESS FOR RECYCLING GASEOUS REACTANTS USED FOR REGENERATING A HYDROCARBON HYDROCONVERSION CATALYST

Roland Huin, Montesson La Borde, and Jean-Claude Barbier, La Celle St. Cloud, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 20, 1978, Ser. No. 917,224
Claims priority, application France, Jun. 20, 1977, 77 19059
Int. Cl.² B01J *23/96, 21/20;* C10G *35/08, 35/12*
U.S. Cl. 252—415 **11 Claims**

1. A process for regenerating a catalyst which is continuously withdrawn from a moving bed hydrocarbon hydroconversion process, said catalyst containing (a) carrier, (b) 0.1 to 10% by weight of elemental chlorine with respect to the catalyst, and (c) 0.005 to 5% of at least one noble metal of the platinum family, in wich the spent catalyst is conducted to a separate regeneration zone and subjected therein at least to (a)

combustion with a modecular oxygen-containing gas, (b) a chlorination or oxychlorination effected with chlorine or a chlorine compound or a mixture of chlorine and a chlorine compound, and (c) a treatment with a gas of high molecular oxygen content; wherein the various gases discharged from the catalyst regeneration zone are treated and then recycled for re-use in the catalyst regeneration zone, by a treatment comprising the steps of (a) cooling the discharged gases to a temperature lower than 70° C., (b) charging the cooled gases to a wash enclosure consisting of two serially arranged wash zones, washing the gases in the first wash zone with an aqueous solution containing, by weight with respect to water, 1 to 10% of sodium or potassium hydroxide or of an equivalent inorganic compound, and then washing the alkali-washed gases with substantially pure water in the second wash zone, (c) supplying



the twice-washed gases to a drying zone, and drying the gases to a water content of lower than 2,500 ppm, and (d) heating and recycling the resultant dried gases to the catalyst regeneration zone;

wherein, in the catalyst regeneration zone, the catalyst is arranged as a fixed or moving bed, inside an enclosure internal to said regeneration zone, where those walls of the enclosure in contact with the catalyst are made of or coated with a material resistant, when hot, to chlorine or hydrochloric acid or any other chlorine compound, and wherein substantially the remaining internal walls of the regeneration zone are made of a material of lower resistance to chlorine, hydrochloric acid or any other chlorine compound than the material of said internal walls of the enclosure in contact with the catalyst.

4,218,339

CATALYST COMPONENTS AND CATALYSTS FOR POLYMERIZING OLEFINS PREPARED FROM THE CATALYSTS

Umberto Zucchini, and Illaro Cuffiani, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 23, 1978, Ser. No. 908,670

Claims priority, application Italy, May 24, 1977, 23942 A/77

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B **22 Claims**

1. Components for catalysts for the polymerization of olefins, consisting of the product obtained by reacting the product of reaction between

(A) a magnesium compound selected from the groups

(1) compounds having formula

$$XnMg(OR)_{2-n}$$

wherein X is a halogen atom, a hydroxyl group or an alkyl, aryl or cycloalkyl radical containing 1–20 carbon atoms; R is an alkyl, aryl or cycloalkyl radical containing 1–20 carbon atoms, or a —COR′ radical in which R′ has the same meaning as R; $0 \leqq n \leqq 2$; or products of reaction of said compounds with hydrocarbyl electron-donor compounds;

(2) compounds having formula

$$RMgX$$

wherein X is a halogen atom, and R is an alkyl, aryl or cycloalkyl radical containing 1–20 carbon atoms, or products of reaction of said compounds with polysiloxane compounds containing from 2 to 1000 monomeric units

in which R is the same or different from R′, R being an alkyl, aryl, alkoxy or aryloxy radical, and R′ being hydrogen, halogen or an alkyl, aryl or cycloalkyl radical containing 1–20 carbon atoms;

(3) Mg oxide, Mg hydroxide, Mg hydroxy halides, or Mg salts of inorganic oxygen containing acids, and

(B) a compound of Ti, V or Zr containing at least two —OR groups linked to a Ti, V or Zr atom through the oxygen atom, and in which R is an alkyl, aryl or cycloalkyl radical having 1–20 carbon atoms, with

(C) a silicon compound capable of substituting, in compound (B), at least one —OR group with a halogen atom and to reduce the valence of the metal of compound (B) to a lower valence, or a mixture of a compound capable of substituting, in compound (B), at least one —OR group with a halogen atom and a compound capable of reducing the metal of compound (B) to a lower valence; with reaction between compounds (A) and (B) being conducted in the presence of a hydrocarbyl electron-donor compound when compound (A) is an (A)(3) compound, and component (C) being a halogenating, but not necessarily a reducing compound when (A) is an (A)(2) compound.

4,218,340

NICKEL AND COBALT CONTAINING CARBONYLATION CATALYST COMPOSITIONS FOR THE PRODUCTION OF CARBOXYLIC ACIDS AND THEIR ESTERS

Jerry D. Holmes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 821,423, Aug. 3, 1977, Pat. No. 4,133,963, which is a continuation-in-part of Ser. No. 633,314, Nov. 19, 1975, abandoned. This application Oct. 16, 1978, Ser. No. 951,426

Int. Cl.[2] B01J *27/08, 31/24, 31/28*

U.S. Cl. 252—429 R **8 Claims**

1. A soluble liquid phase carbonylation catalyst consisting of MX_n:Z:R_3P wherein M is selected from the group consisting of Co and Ni, X is selected from the group consisting of carboxylate ions of from 2 to 10 carbon atom, halides, oxides, acetyl acetonate, carbon monoxide and hydrogen, n is 1 to 5, R is selected from the group consisting of alkyl or alkylphenyl of from 4 to 10 carbon atoms; and Z is an iodide source selected from the group consisting of hydrogen iodide, iodine, alkyl iodides, alkali metal iodides and alkaline earth iodides, wherein the molar ratio of M to iodide source is in the ratio of from about 1:2 to about 1:10, and the molar ratio of M to R_3P is from about 1:0.5 to about 1:10.

4,218,341

PROCESS FOR THE APPLICATION OF A CATALYTICALLY ACTIVE COATING ON A CATALYST CARRIER

Eduard Lakatos, Rheinfelden; Edgar Koberstein, Alzenau; Jörg Hensel, Hanau, and Alfred Bozon, Erlensee, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 703,332, Jul. 8, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 868,017

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1975, 2531770

Int. Cl.[2] B01J *23/08*

U.S. Cl. 252—430 8 Claims

1. In a process of making a catalyst wherein a coating of at least one catalytically active element is applied to the external surfaces of a porous catalyst carrier having a large surface area from a solution of said at least one catalytically active element, and wherein said catalyst carrier is contacted with an organic liquid prior to applying the coating of at least one catalytically active element to said catalyst carrier and wherein the saturation of said catalyst carrier is not exceeded by contacting with said organic liquid; the improvement which comprises adding a solution of a complexing, precipitating or reducing agent for said catalytically active element to said organic liquid.

4,218,342

COMPOSITION FOR CATALYTIC REMOVAL OF HYDROGEN SULFIDE FROM GASES

Ralph B. Thompson, Oak Brook, Ill., assignor to Air Resources, Inc., Palatine, Ill.

Division of Ser. No. 815,788, Jul. 14, 1977, which is a continuation-in-part of Ser. No. 728,855, Oct. 1, 1976, abandoned, which is a continuation of Ser. No. 551,279, Feb. 20, 1975, abandoned. This application Jul. 2, 1979, Ser. No. 54,171

Int. Cl.[2] B01J *31/22*

U.S. Cl. 252—431 C 14 Claims

1. A composition for use in an oxidation-reduction process for effecting the catalytic oxidation of hydrogen sulfide gas which comprises a water soluble ferric iron salt and at least two water soluble iron chelating agents with at least one of said iron chelating agents being selected from a group of amine chelating agents consisting of polyamino polycarboxylic acids, polyamino alkyl polycarboxylic acids, polyamino hydroxyalkyl polycarboxylic acids, and poly(phosphonoalkyl) amines, and their alkali metal salts, and at least one other of said iron chelating agents being selected from the group of polyhydroxy chelating agents consisting of monosaccharides, disaccharides, reduced monosaccharides, reduced disaccharides, monosaccharide acids, and disaccharide acids, and their alkali metal salts.

4,218,343

DEHYDROGENATION OF ORGANIC COMPOUNDS

Darrell W. Walker; Robert J. Hogan, and Floyd Farha, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 617,754, Sep. 29, 1975, Pat. No. 4,167,532. This application May 1, 1979, Ser. No. 35,132

Int. Cl.[2] B01J *27/14*

U.S. Cl. 252—435 4 Claims

1. An oxidative dehydrogenation catalytic material consisting essentially of from about 30 to about 75 weight percent nickel, from about 5 to about 50 weight percent lead, from about 0.1 to about 7 weight percent phosphorus and optionally an alkali metal in an amount equivalent, on an atomic basis, to from 0 to 5 weight percent of potassium, wherein at least one of said nickel, lead, phosphorus and alkali metal is associated with oxygen.

4,218,344

CATALYTIC CRACKING WITH REDUCED EMISSION OF NOXIOUS GASES

Iacovos A. Vasalos, Downers Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 748,556, Dec. 8, 1976, Pat. No. 4,153,534, which is a continuation-in-part of Ser. No. 642,542, Dec. 19, 1975, abandoned. This application Jan. 11, 1979, Ser. No. 2,533

Int. Cl.[2] B01J *29/04*

U.S. Cl. 252—455 Z 5 Claims

1. A fluidizable solid cracking catalyst composition for use in the cracking of hydrocarbon feedstocks containing organic sulfur compounds under fluidizing conditions, comprising a silica-alumina cracking catalyst matrix containing from about 10 to about 65 weight percent of alumina and from about 35 to about 90 weight percent of silica, wherein from about 0.5 to about 50 weight percent of a molecular sieve is distributed throughout said matrix, and wherein from about 0.6 to about 3 weight percent of sodium is incorporated onto the surface of said molecular sieve containing matrix.

4,218,345

OLEFIN POLYMERIZATION CATALYST OF CHROMIUM AND PROCESS OF PREPARING IT

Raymond E. Hoff, Palatine, and Thomas J. Pullukat, Hoffman Estates, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Jan. 15, 1979, Ser. No. 3,117

Int. Cl.[2] B01J *21/04, 21/08, 23/26*

U.S. Cl. 252—458 48 Claims

1. A dispersion of reactive chromium particles on a support, useful for making an olefin polymerization catalyst by heat activating in an oxidizing gas, prepared by the process of (1) forming a sublimate of chromium metal particles by subliming chromium metal under high vacuum conditions while adding an organic liquid and condensing said chromium and organic liquid on a cold surface that is at a temperature such that the vapor pressure of the organic liquid is 10^{-3} torr or less, (2) forming a mixture of said sublimate particles and organic liquid and a finely divided, difficultly reducible support selected from the group consisting of silica, alumina, zirconia, thoria, titania, magnesia and mixtures thereof, (3) heat activating the mixture of (2) in an oxidizing gas atmosphere, and (4) separating the organic liquid by evaporation.

4,218,346

ZINC TITANATE CATALYST FOR DEHYDROGENATION OF HYDROCARBONS

Darrell W. Walker, and Floyd E. Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 844,932, Oct. 27, 1977, Pat. No. 4,144,277, which is a continuation-in-part of Ser. No. 743,196, Nov. 19, 1976, abandoned. This application Jan. 8, 1979, Ser. No. 2,056

Int. Cl.[2] B01J *21/06, 23/06*

U.S. Cl. 252—475 6 Claims

1. A catalyst composition consisting essentially of zinc, titanium and sufficient oxygen to satisfy the valence requirements of said zinc and said titanium prepared by calcining a mixture of zinc oxide and titanium dioxide in the presence of oxygen at a temperature in the range of about 650° C. to about 1050° C. to form zinc titanate, wherein the atomic ratio of zinc to titanium in said zinc titanate is in the range of about 1.74:1 to about 2.15:1, and wherein said titanium dioxide has an average particle size of less than about 100 millimicrons.

4,218,347

BICYCLIC ALDEHYDE PERFUMING AND FLAVORING INGREDIENTS

Ferdinand Näf, Geneva, and René Decorzant, Onex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

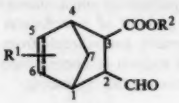
Filed Sep. 8, 1978, Ser. No. 940,836

Claims priority, application Switzerland, Sep. 15, 1977, 11281/77; Luxembourg, Oct. 3, 1977, 78234

Int. Cl.[2] A61K *7/46;* C11B *9/00;* C07C *69/00*

U.S. Cl. 252—522 R 3 Claims

1. Process for improving, modifying or enhancing the organoleptic properties of perfumes and perfumed products, which process comprises the step of adding thereto an effective amount of at least one of the compounds of formula



wherein there is a single or a double bond in the position indicated by the dotted lines and the symbol R^1 represents a hydrogen atom or a methyl radical and R^2 is a linear or branched alkyl radical containing 1 to 6 carbon atoms.

4,218,348

ESTERS OF 1,5-DIMETHYLBICYCLO-[3,2,1]OCTAN-8-OL

Albertus J. Mulder, and Aaldert J. de Jong, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

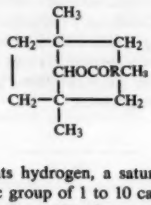
Filed May 8, 1979, Ser. No. 37,196

Claims priority, application Netherlands, May 12, 1978, 7805143

Int. Cl.[2] A61K *7/46;* C07C *101/52*

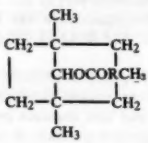
U.S. Cl. 252—522R 7 Claims

1. A carboxylic acid ester of 1,5-dimethylbicyclo [3,2,1]octan-8-ol with the formula:



wherein R represents hydrogen, a saturated or unsaturated aliphatic or alicyclic group of 1 to 10 carbon or an aromatic hydrocarbon group of up to 7 carbon atoms, optionally substituted with an amino group.

7. A perfume composition containing components usual for this purpose and as a portion or all of the fragrance component, a carboxylic acid ester of 1,5-dimethylbicyclo[3,2,1]octan-8-ol with the formula:



wherein R represents hydrogen, a saturated or unsaturated aliphatic or alicyclic group of 1 to 10 carbon atoms or an aromatic hydrocarbon group of up to 7 carbon atoms, optionally substituted with an amino group.

4,218,349

RUBBER COMPOSITION

Shobu Minatono, and Hideo Takamatsu, both of Kashima, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Dec. 19, 1978, Ser. No. 971,042

Int. Cl.[2] C08L *7/00, 9/00*

U.S. Cl. 260—5 5 Claims

1. A rubber composition comprising 5 to 45% by weight of a modified liquid rubber and 95 to 55% by weight of a natural rubber based on the total content of modified liquid rubber and natural rubber, said modified liquid rubber being an adduct of maleic anhydride or a derivative thereof with a liquid polyisoprene rubber with a cis-1,4 content of not less than 70% and a molecular weight of 8,000 to 100,000, said maleic anhydride or said derivative being present in an amount of 0.1 to 15 mol % per isoprene unit in said liquid polyisoprene rubber.

4,218,350

SHAPED SYNTHETIC POLYMERS CONTAINING A BIODEGRADABLE SUBSTANCE

Gerald J. L. Griffin, London, England, assignor to Coloroll Limited, London, England

Filed Sep. 8, 1978, Ser. No. 940,839

Claims priority, application United Kingdom, Sep. 16, 1977, 38772/77

Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.4 ST 6 Claims

1. In a process of manufacturing a plastic based product which includes the step of feeding a feedstock to a shaping apparatus which develops extreme conditions, said feedstock comprising polymer granules and natural starch granules with the surfaces thereof rendered hydrophobic, the improvement which eliminates the necessity of hot compounding the said feedstock comprising incorporating a lubricant which is an oily material with the said granules, whereby the granules of starch are coated with said lubricant when undergoing the physically extreme conditions.

4,218,351

IMPACT RESISTANT, THERMOPLASTIC POLYAMIDES

Jerald K. Rasmussen, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 17, 1978, Ser. No. 924,856

Int. Cl.[2] C08G *69/26;* C08L *91/00;* C09J *3/16*

U.S. Cl. 260—18 N 14 Claims

1. A copolyamide having a Brookfield melt viscosity of less than 100 poise at 232° C., an impact resistance of at least 180 kg-m/square meter at −18° C. and at least 890 kg-m/square meter at 21° C. and a ball and ring softening temperature of at least 110° C., comprising the copolymerization product of:

a. 57.5 to 94.75 mole percent short chain polyamide-forming species;

b. 5 to 30 mole percent polyamide-forming dimer acid;

c. 0.25 to 12.5 mole percent amorphous polyamide forming oligomers having a number average molecular weight in the range of about 600 to about 10,000.

4,218,352

STABILIZED HALOGEN-CONTAINING RESIN COMPOSITIONS

Kouji Takeuchi; Masao Nakamura, both of Yokohama; Nobuyoshi Kitamura, Sagamihara, and Shohachi Matsuura, Kawasaki, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Oct. 31, 1978, Ser. No. 956,363

Claims priority, application Japan, Nov. 15, 1977, 52-136858; Feb. 17, 1978, 53-17182

Int. Cl.[2] C08K *5/11*

U.S. Cl. 260—23 XA 15 Claims

1. A halogen-containing resin composition, comprising: a halogen-containing resin selected from the group consisting of polyvinyl chloride, polyvinylidine halide, copolymers of vinyl

chloride and vinylidine chloride, copolymers of vinyl chloride and ethylene and copolymers of vinyl halide or vinylidine halide with vinyl esters of carboxylic acids, esters of unsaturated acids, vinyl aromatic compounds, esters of α, β-unsaturated carboxylic acids, halogenated polyolefins or polyolefins containing halogenide catalyst residues, a resin stabilizing amount of a divalent metal stabilizer compound selected from the group consisting of a zinc compound and an alkaline earth compound and a stabilizer assistant consisting of a premixed melt blend derived from a mixture of (A) a polyhydric alcohol selected from the group consisting of pentaerythritol, dipentaerythritol, tripentaerythritol and mixtures thereof and (B) a partial ester of said polyhydric alcohol and a carboxyl group-containing compound selected from the group consisting of aliphatic saturated or unsaturated monocarboxylic acids having 1 to 30 carbon atoms, aliphatic dicarboxylic acids having 3 to 16 carbon atoms, aromatic carboxylic acids, amino acids, pyroglutamic acid, hydroxy carboxylic acids having 2 to 10 carbon atoms, N-acyl, N-alkyl or N-polyether derivatives of said amino acids and said pyroglutamic acid and ω-monoesters of α, ω-dicarboxyamino acids, said acid partial ester having at least one free hydroxyl group in the molecule, wherein the weight ratio of said polyhydric alcohol to said partial ester ranges from 9:1 to 1:9.

4,218,353

EXTERNAL LUBRICANT COMPOSITIONS FOR RIGID VINYL POLYMERS

Yang K. Kim, Repulse Bay, Hong Kong, assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 18, 1976, Ser. No. 742,829
Int. Cl.[2] C08L *91/06*
U.S. Cl. 260—28.5 D **7 Claims**

1. A rigid polyvinylchloride polymer composition containing as an external lubricant a composition comprising a blend of:

(a) from about 60 to 99 percent by weight of an alpha-olefin having
  (1) an average molecular weight of from about 350 to 900,
  (2) a minimum congealing point of 120° F. as determined by ASTM D-938,
  (3) a minimum iodine value of 30, and
  (4) a maximum Brookfield viscosity at 257° F. of 100 centipoises; and

(b) from about 1 to 40 percent by weight of an oxidized low molecular weight polyethylene having an average molecular weight of less than about 5,000.

4,218,354

BINDER COMPOSITION AND COATING CONTAINING THE SAME

Hossein Hayati, and John R. Flasch, both of Adrian, Mich., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 453,760, Mar. 22, 1974, which is a continuation-in-part of Ser. No. 176,237, Aug. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 75,678, Sep. 25, 1970, abandoned. This application Mar. 29, 1976, Ser. No. 671,871
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—29.2 M **7 Claims**

1. A coating composition consisting essentially of zinc dust and a binder which consists essentially of a condensate having an SiO_2 content of from 5 to 40 percent by weight, said condensate is obtained from the reaction of a silane selected from the group consisting of

$R\ Si\ (OR')_3$ and

$R\ Si\ (OR''OR''')_3$

in which R and R′ represent hydrocarbon radicals having up to 10 carbon atoms, R″ is a divalent hydrocarbon radical having from 2 to 6 carbon atoms and R‴ is selected from the group consisting of hydrocarbon radicals having up to 10 carbon atoms and hydrogen, with sufficient water to provide at least 0.8 mole of water per hydrocarbonoxy group connected to the silicon atom in the presence of a solvent for said condensate and a sufficient amount of an organic acid to provide a pH of from about 1.0 to about 5.5, said organic acid is free of hydroxyl groups, and has a pKa value in an aqueous solution of from 1.0 to about 7.0 at 25° C., and the ratio of binder to zinc dust is from 50:50 to 10:90 on a weight basis.

4,218,355

LOW ORGANIC SOLVENT-CONTAINING POLYESTER COATING COMPOSITIONS

Wen-Hsuan Chang, Gibsonia; John R. Peffer, Pittsburgh, and Ronald J. Lewarchik, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1978, Ser. No. 926,690
Int. Cl.[2] C08L *61/28*
U.S. Cl. 260—29.4 R **13 Claims**

1. A coating composition having an organic solvent content of less than about 30 percent, said composition consisting essentially of:

a. an at least 40 percent resins solids content of:
  (i) from about 15 parts to about 90 parts of an ester-containing polyol having a number average molecular weight of from about 160 to about 500, a hydroxyl value of from about 180 to about 800 and a viscosity of less than about 600 poises, said ester-containing polyol being the esterification product of (1) an acid reactant comprising from about 55 molar percent to about 100 molar percent of an aromatic or alicyclic monobasic acid, and from about 0 molar percent to about 45 molar percent of an aromatic, alicyclic or aliphatic dicarboxylic acid or their anhydrides where they exist, or mixture thereof, and (2) an alcohol reactant comprising a polyol having a hydroxyl functionality of from about 2.1 to about 5.0 wherein the equivalent ratio of the acid reactant to the alcohol reactant is from about 1:19 to about 1:1.2; and
  (ii) from about 10 parts to about 85 parts of an amine-aldehyde resin; and

b. the balance, if any, water.

4,218,356

PRODUCT OF AND PROCESS FOR POLYMERIZING AN AQUEOUS REACTION MIXTURE CONTAINING IONIZING AGENT AND COSOLVENT THAT FORMS AN AQUEOUS DISPERSION OF RESINOUS POLYELECTROLYTE

James M. Evans, Lynn Haven, Fla., and Carlos E. Ortiz, Medina, Ohio, assignors to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 920,770, Jun. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 844,739, Oct. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 577,916, May, 15, 1975, abandoned. This application Oct. 24, 1978, Ser. No. 954,225
Int. Cl.[2] G08L *33/02*
U.S. Cl. 260—29.6 TA **13 Claims**

1. A process for addition polymerizing normally liquid addition polymerizable reactants, including an ionizable reactant, without substantial surfactant which comprises:

establishing and maintaining an agitated reaction mixture comprising:
  water,
  at least about 0.05 part of cosolvent per part of said water, but insufficient cosolvent to cause a substantial proportion of the resulting addition polymerized resinous polyelectrolyte product to form a clear solution in said water,
  at most about one part of said polymerizable reactants per part of said water, said reactants having 0.0005–0.005 neutralization equivalent of an ionizable monomer per gram, and sufficient ionizing agent to ionize at least

about 0.0001 neutralization equivalent of said ionizable monomer;

polymerizing by free-radical catalysis said reactants in said reaction mixture at temperature of about 25°–300° C., and under pressure sufficient for suppressing ebullition of said reaction mixture, thereby yielding a substantially surfactant-free aqueous dispersion of said addition polymerized resinous polyelectrolyte product, said resinous polyelectrolyte product having mean weight average not substantially greater than 100,000 molecular weight.

4,218,357

PLASTICIZED POLYCARBONATE COMPOSITION

Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

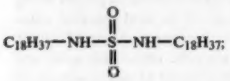
Continuation of Ser. No. 811,065, Jun. 29, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,299

Int. Cl.[2] C08K 5/43

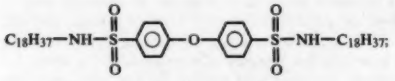
U.S. Cl. 260—30.8 R **4 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an organic plasticizer selected from the following formulae:

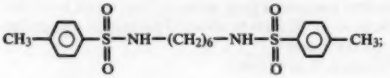
(a)



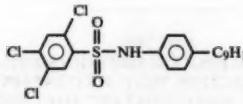
(b)



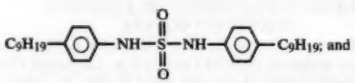
(c)



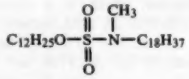
(d)



(e)



(f)



4,218,358

PROCESS FOR REMOVING UNREACTED MONOMERS FROM POLYMERIZATION SLURRIES

Arthur A. Armstrong, Cary, N.C.; Gerd R. Baur, Decatur, Ala.; Charles N. Carpenter, St. Louis; Edwin W. Folk, Manchester, both of Mo.; Donald J. Stookey, Raleigh, N.C., and Robert L. Voges, Muscatine, Iowa, assignors to Monsanto Company, Decatur, Ala.

Filed Apr. 10, 1978, Ser. No. 894,788

Int. Cl.[2] C08K 5/17, 5/41

U.S. Cl. 260—32.6 N **5 Claims**

1. The method of recovering unreacted mono-olefinic monomers from an acrylonitrile bulk polymerization slurry containing 30 to 50 weight percent of polymer solids and 70 to 50 weight percent of unreacted mono-olefinic monomers, comprising:

a. diluting the slurry with a sufficient amount of a solvent selected from the group consisting of dimethylacetamide and dimethylsulfoxide to reduce the solids content of the diluted slurry to 20 to 25 weight percent.

b. passing the diluted slurry through first and second treatment zones in series, each of said treatment zones having a first stage for mixing the slurry with a solvent in vapor form and a second stage for separating vapors from the polymer solution formed from the slurry in the first stage.

c. supplying to the mixing stage of the second treatment zone a solvent selected from the group consisting of dimethylacetamide, dimethylformamide and dimethylsulfoxide, said solvent being in vapor form at a temperature in the range of 115° to 150° C. and being fed at a rate of 0.8 to 4 times the rate at which slurry is fed to the first treatment zone.

d. separating solvent and unreacted vapors from the polymer solution in the second stage of the second treatment zone.

e. supplying the mixing stage of the first treatment zone with the vaporized solvent and unreacted monomers from the second stage of the second zone to vaporize a portion of the unreacted monomers in the slurry entering the first treatment zone, and

f. separating said vaporized solvent and unreacted monomers from the polymer solution in the separation stage of the first treatment zone.

4,218,359

ORGANOPOLYSILOXANE COMPOSITIONS AND A PROCESS FOR TREATING ORGANIC FIBERS

Heinrich Marwitz, and Eckhart Louis, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 782,124, Mar. 28, 1977, abandoned. This application May 26, 1978, Ser. No. 910,032

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615078

Int. Cl.[2] C08K 5/02

U.S. Cl. 260—33.8 SB **7 Claims**

1. An organopolysiloxane composition for treating fibers which can be stored under substantially anhydrous conditions but cures when exposed to moisture consisting of (A) a diorganopolysiloxane having terminal Si-bonded hydroxyl groups, (B) an organosilicon compound selected from the group consisting of organosilanes of the formula $RSiR'_nX_{3-n}$, in which R is a monovalent radical having at least two amino groups which are bonded to silicon via silicon-carbon bonds, R' is selected from the group consisting of alkyl and aryl radicals, X is selected from the group consisting of alkyl and substituted alkyl radicals having from 1 to 14 carbon atoms per group which are bonded to silicon via oxygen, n is 0 or 1, partial hydrolysates of said organosilanes and mixtures thereof, (C) an organosilane other than (B) having the formula

$$R''Si(ON{=}CX)_3$$

where R'' is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, and X is selected from the group consisting of R''_2, a bivalent hydrocarbon radical and a halogenated hydrocarbon radical, (D) a condensation catalyst and an organic solvent.

5. The composition of claim 1, wherein the catalyst (D) is a tin acylate.

4,218,360
EPOXY RESINS FILLED WITH DUAL-SILANE TREATED HYDRATED ALUMINA

Allison S. Burhans, Millington, N.J., and Sidney E. Berger, Rye, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,393
Int. Cl.² C08L 63/00
U.S. Cl. 260—37 EP **17 Claims**

1. A composition comprising:

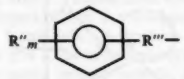
(A) a curable cycloaliphatic polyepoxide resin;

(B) a curing agent for said polyepoxide resin;

(C) a particulate hydrated alumina filler of the formula $Al_2O_3.xH_2O$, wherein x has a value from 1 to 3;

(D) a first organosilane of the formula $XRSiY_3$, wherein R is a saturated hydrocarbon radical containing at least 2 carbon atoms in sequence separating X from Si and is bonded to both; X is an organic group which contains a vicinal epoxy group, and Y is hydroxyl or a hydrolyzable group, said first organosilane being present at a concentration of from 0.1 to 5.0 weight percent, based on the weight of the hydrated alumina filler; and

(E) a second organosilane having the formula $R'SiY_3$ wherein Y is hydroxyl or a hydrolyzable group and R' is alkyl from 1 to 18 carbon atoms or



wherein R''' is alkylene of 1 to 8 carbon atoms, alkyleneoxy of 1 to 8 carbons, or a valence bond, R'' is alkyl of 1 to 8 carbon atoms, and m has a value from 0 to 2, said second organosilane being present at a concentration of from 0.5 to 5 parts by weight per part of said first organosilane.

4,218,361
FRICTION MATERIAL

William H. Searfoss, and Gerald P. Jones, both of Ridgway, Pa., assignors to Molded Materials Company, Div. Carlisle Corporation, Ridgway, Pa.

Filed Mar. 14, 1979, Ser. No. 20,431
Int. Cl.² C08K 3/08, 3/22, 3/34
U.S. Cl. 260—38 **10 Claims**

1. An improved heat and wear resistant friction material comprising in approximate percent by weight; asbestos fibers 20%–60%, phenolic resin 15%–33%, spun blast furnace slag fibers 1%–15%, rubber particles 3%–9%, fillers 10%–35%, metallic oxide 2%–12%.

4,218,362
POWDER MARKING AGENT AND MARKING METHOD

Satoru Honjo; Kenichi Sawada, both of Asaka, and Masaki Fukagawa, Saga, all of Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara and Chugoku Marine Paints, Ltd., Hiroshima, both of, Japan

Filed Nov. 17, 1977, Ser. No. 852,263
Claims priority, application Japan, Nov. 19, 1976, 51/139177
Int. Cl.² C08L 27/18, 67/02
U.S. Cl. 260—40 R **33 Claims**

1. A marking agent powder comprising

(a) about 48% to about 92% by volume of a thermoplastic linear polyester of at least one aromatic dicarboxylic acid, as an acid component, and at least one of a 2,2-alkyl-substituted 1,3-propanediol and a linear alkylene or polyalkylene glycol, as a diol component,

(b) about 5 to about 30% by volume of a heat-resistant pigment, and

(c) about 2 to about 40% by volume of a fluorine containing polymer,

the total percent by volume of the heat-resistant pigment (b) and the fluorine-containing polymer (c) being about 45% by volume or less.

4,218,363
PREPARATION OF SUPPORT MATRICES FOR IMMOBILIZED ENZYMES

Ronald P. Rohrbach, Forest Lake, and George W. Lester, Hoffman Estates, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 16, 1978, Ser. No. 951,947
Int. Cl.² C08K 9/00
U.S. Cl. 260—42.14 **5 Claims**

1. A process for the preparation of an organic-inorganic support matrix having pendent bonding sites for enzymatic conjugates which comprises:

(a) adsorbing on a solid, porous, inorganic, water-insoluble support a nitropolystyrene compound;

(b) chemically reducing said nitropolystyrene compound and solid, porous, inorganic, water-insoluble support of step (a) with a chemical reducing agent to form aminopolystyrene;

(c) contacting with said reduced aminopolystyrene adsorbed support of step (b) a bifunctional monomer comprising an organic compound containing a moiety selected from the group consisting of acyl, isocyanato and carbonyl moieties in molar excess of from about 3 to about 50 mole proportions of bifunctional monomer relative to the amino of the aminopolystyrene compound formed in step (b); and

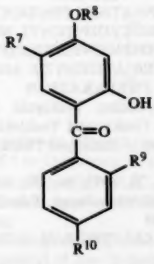
(d) recovering said organic-inorganic support matrix having pendent bonding sites for enzymatic conjugate attachment thereto.

4,218,364
LIGHT STABILIZED POLYPHENYLENE ETHER RESIN COMPOSITION

Glenn D. Cooper, and Visvaldis Abolins, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 428,448, Dec. 26, 1973, Pat. No. 3,925,509.
This application Sep. 9, 1975, Ser. No. 611,786
Int. Cl.² C08L 51/00, 53/00
U.S. Cl. 260—45.7 P **7 Claims**

1. A stabilized composition comprising a major amount of a thermoplastic resin having from 20–80 parts by weight of a normally unstable polyphenylene ether component, from 20–80 parts by weight of a rubber modified, high impact styrene resin and from 0.5 to 5 parts by weight of a stabilizer which comprises in combination, a first component which is an ultra violet light absorber selected from the group consisting of compounds of the formula:



wherein R^7 is hydrogen or sulfo; R^8 is hydrogen or an alkyl group of from 1 to 18 carbon atoms; R^9 is hydrogen or hydroxy R^{10} is a hydrogen, hydroxy or an alkoxy group having from 1 to 18 carbon atoms; and a second component which is an organic nickel complex; the weight ratio of the first component to the second component being from 0.25:1 to 4:1.

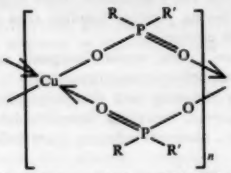
4,218,365

POLYAMIDE FIBERS HAVING IMPROVED OZONE FADING RESISTANCE

James S. Ridgway; Richard D. Chapman, both of Pensacola, Fla.; Kurt Moedritzer, Webster Groves, Mo., and Oscar A. Pickett, Jr., Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 1, 1978, Ser. No. 965,633
Int. Cl.[2] C08K *5/52, 5/53*
U.S. Cl. 260—45.75 C **10 Claims**

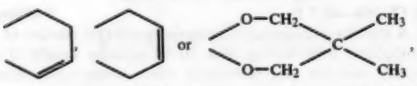
1. A polyamide fiber containing as an antiozonant one or more poly(copper phosphinates) of the formula



where R is —H, —CH_3, —C_2H_5, —$CH_2CH_2CO_2H$ or

R′ is

and n is a whole number greater than 1, with the proviso that R and R′ may be joined to form the radical



wherein said phosphinate is present in an amount sufficient to provide from about 25 to about 100 parts per million of copper, based on the weight of the polyamide.

4,218,366

CONDENSATION PRODUCT OF 4,4′-DIHYDROXYDIPHENYL SULFONE, 4,4′-DIHYDROXYDIPHENYLSULFONE SULFONIC ACID AND A LOWER ALDEHYDE AND METHOD OF PREPARATION

Akio Kobayashi, Toyonaka; Yoshiyuki Shimohiro, Sakai; Kisaburou Shimizu, Osaka, and Yoshiaki Murakami, Kobe, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 21, 1975, Ser. No. 551,994
Claims priority, application Japan, Feb. 21, 1974, 49-21232; Oct. 3, 1974, 49-114549
Int. Cl.[2] C08G *8/18, 8/20*
U.S. Cl. 528—143 **10 Claims**

1. A condensation product mixture of 4,4′-dihydroxydiphenylsulfone, 4,4′-dihydroxydiphenylsulfonesulfonic acid and a lower aliphatic aldehyde, or its salt with a metal selected from the group consisting of calcium, barium, magnesium, aluminum and iron; said 4,4′-dihydroxydiphenylsulfone and 4,4′-dihydroxydiphenylsulfonesulfonic acid being a product mixture formed by treating 1.0 mole of 4,4′-dihydroxydiphenylsulfone with 0.8 to 1.0 mole of sulfuric acid so that the average molar ratio of 4,4′-dihydroxydiphenylsulfonesulfonic acid to free 4,4′-dihydroxydiphenylsulfone in the resultant mixture is from 0.015 to 1.1; the condensation product mixture having a mean molecular weight of about 5,000 to about 30,000 and a ratio of carbon atom content and sulfur atom content of 3.0:1 to 4.8:1.

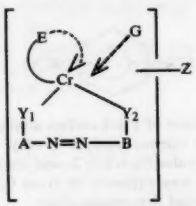
4,218,367

REACTIVE COMPLEX CHROMIUM-BEARING AZO DYESTUFFS

Claude M. H. E. Brouard, St. Pierre les Elbeuf, and Claude L. E. Moerel, Bihorel, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Nov. 26, 1976, Ser. No. 745,275
Claims priority, application France, Nov. 28, 1975, 75 36461
Int. Cl.[2] C09B *62/08, 62/24, 62/40, 62/50*
U.S. Cl. 260—146 R **10 Claims**

1. A complex chromium bearing dyestuff of the formula:



wherein A represents a phenylene or naphthylene nucleus; B represents a coupling component selected from the group consisting of acetoacetarylide, aniline, phenol, 5-pyrazolone, naphthylamine and naphthol,

A and B being unsubstituted or substituted by one or more of sulfo, halogen, nitro, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, acetylamino, unsubstituted phenylamino, phenylamino substituted by sulfo, unsubstituted phenylazo or naphthylazo, phenylazo or naphthylazo substituted by one or more of nitro, halogen, carboxy, sulfo or alkoxy having 1–4 carbon atoms, unsubstituted phenyl or phenyl substituted by one or more of sulfo or halogen, at least one —SO_3H group being present per atom of chromium;

Y_1 represents the residue —O— or

Y_2 represents the residue —O— or —NH—;

Y_1 and Y_2 are respectively in the ortho position with respect to the —N=N— group;

E represents the residue of a monoanionic bifunctional chelating agent;

G represents a neutral monofunctional ligand; and

Z represents a reactive group attached to A or to B directly or via a bridging group

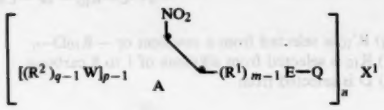
—SO_2NH— or —CONH— wherein R is hydrogen or alkyl having 1 to 2 carbon atoms.

4,218,368
AROMATIC NITRO COMPOUNDS CONTAINING DIFFUSIBLE GROUPS CLEAVABLE BY INTRAMOLECULAR NUCLEOPHILIC DISPLACEMENT

Jerald C. Hinshaw, Penfield, and Richard P. Henzel, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 775,219, Mar. 7, 1977, Pat. No. 4,139,389.
This application Jul. 26, 1978, Ser. No. 928,050
Int. Cl.² C07C *107/00, 107/04;* C09B *43/16, 43/18*
U.S. Cl. 260—156 12 Claims

1. A compound having the formula:



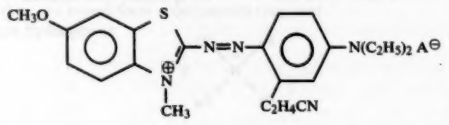
where A represents a group containing the atoms necessary to form a 5- or 6-membered aromatic ring with the remainder of said formula; W is an electron withdrawing group having a positive Hammett sigma value; R^2 is a hydrogen atom, an alkyl group containing from 1–30 carbon atoms, or an aryl group containing from 6–30 carbon atoms; R^1 is a bivalent organic group containing from 1–3 atoms in the bivalent linkage; m and q are positive integers of 1 or 2; p is a positive integer of 1 or greater, and p is 1 only when A contains an aromatic 'onium group, and when p is 2, the substituent $[(R^2)_{q-1}W]$ is ortho or para to the nitro group on said formula; E and Q provide an electrophilic cleavage group where E is an electrophilic center, and Q is a bivalent group providing a monoatom linkage between E and X^1 wherein said bivalent group is an oxygen atom, a sulfur atom, a selenium atom or a nitrogen atom providing an amino group; n is an integer of 1–3; and X^1, together with Q is either an image dye-providing material or a photographic reagent.

4,218,369
CYCLOAMMONIUM-AZO-PHENYL-DYESTUFFS CONTAINING ONE CYANOETHYL, CARBAMOYLETHYL OR CARBALKOXYETHYL GROUP ON THE PHENYL RADICAL

Claude M. H. E. Brouard, St. Pierre les Elbeuf; Claude L. E. Moerel, Bihorel, and Jean-Pierre H. Stiot, St. Pierre les Elbeuf, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

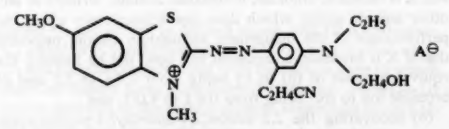
Filed Sep. 30, 1977, Ser. No. 838,326
Claims priority, application France, Oct. 12, 1976, 76 30580
Int. Cl.² C09B *29/08;* D06P *3/24, 3/52, 3/76*
U.S. Cl. 260—157 5 Claims

1. Cationic azo dyestuff having the formula:



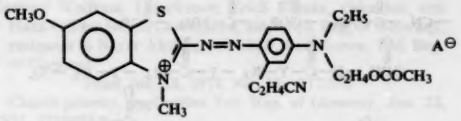
in which $A^{\ominus}$ represents an anion.

2. Cationic azo dyestuff having the formula:



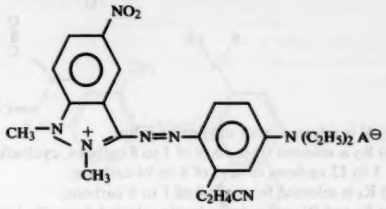
in which $A^{\ominus}$ represents an anion.

3. Cationic azo dyestuff having the formula:



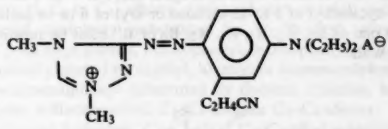
in which $A^{\ominus}$ represents an anion.

4. Cationic azo dyestuff having the formula:



in which $A^{\ominus}$ represent an anion.

5. Cationic azo dyestuff having the formula:



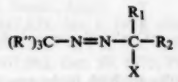
in which $A^{\ominus}$ is an anion.

4,218,370
AZO MONOMER USEFUL IN POLYMERIZATION SYSTEMS

Chester S. Sheppard, Kenmore, and Ronald E. MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 14, 1979, Ser. No. 38,992
Int. Cl.² C07C *107/02;* C08J *9/00*
U.S. Cl. 260—192 6 Claims

1. A compound of the formula

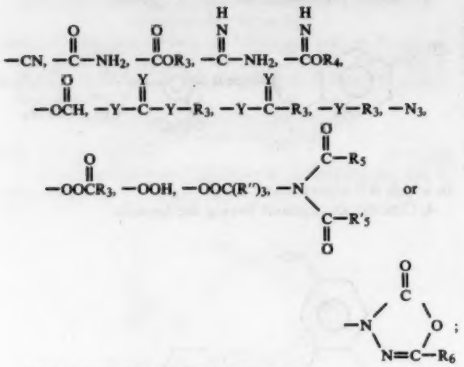


wherein:

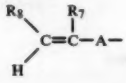
(a) R″s are independently selected from alkyl of 1 to 8 carbons, aralkyl of 7 to 12 carbons, or aryl of 6 to 14 carbons, with the proviso that only one R″ may be aryl, the R″s can also be joined to form a cyclo, bicyclo or tricyclo of 3 to 12 carbons;

(b) R_1 and R_2 are independently selected from alkyl of 1 to 8 carbons, cycloalkyl of 3 to 12 carbons, aralkyl of 7 to 12 carbons, or a ring substituted cycloalkyl of 5 to 6 carbons wherein the ring substituent is one or more of oxygen, nitrogen or sulfur, R_1 and R_2 can be joined to form an alkylene diradical of 3 to 11 carbons, R_1 can also be an aryl of 6 to 14 carbons;

(c) X is selected from

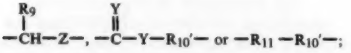


(d) Y is selected from oxygen or sulfur;
(e) R_3 is selected from alkyl of 1 to 8 carbons, cycloalkyl of 3 to 12 carbons or aryl of 6 to 14 carbons;
(f) R_4 is selected from alkyl of 1 to 6 carbons;
(g) R_5 and R'_5 are independently selected from alkyl of 1 to 8 carbons or aryl of 6 to 14 carbons, R_5 and R'_5 can be joined to form an alkylene diradical of 1 to 8 carbons or an arylene diradical of 6 to 14 carbons;
(h) R_6 is selected from hydrogen, alkyl of 1 to 8 carbons, cycloalkyl of 3 to 12 carbons or aryl of 6 to 14 carbons;
(i) one of R_1, R_2, R_3, R_4, R_5, R_6 or R'' must be substituted with

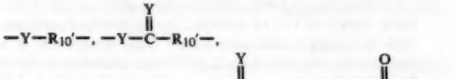


(j) R_7 is selected from hydrogen, alkyl of 1 to 6 carbons or Cl—;
(k) R_8 is selected from hydrogen or

(l) R_9 is selected from H or alkyl of 1 to 6 carbons;
(m) when R_8 is hydrogen, A is selected from

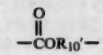


(n) when R_7 and R_8 are both hydrogen, A is selected from

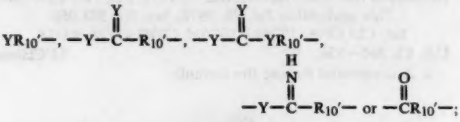


(o) when R_8 is

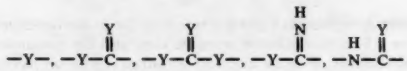
R_7 is hydrogen and A is



(p) Z is selected from



(q) R'_{10} is selected from a covalent or $—R_{10}D—$;
(r) R_{10} is selected from alkylene of 1 to 8 carbons;
(s) D is selected from



or covalent bond; and
(t) R_{11} is selected from aryl of 6 to 14 carbons, pyridine, carbazole, pyrrolidone, piperidone or caprolactam.

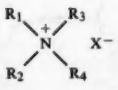
4,218,371

PROCESS FOR PREPARING 2,2'-AZOBIS(2,4-DIMETHYL-4-METHOXYPENTANENITRILE)

Earl P. Moore, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 851,389, Nov. 14, 1977, Pat. No. 4,132,729. This application Sep. 25, 1978, Ser. No. 944,571
Int. Cl.[2] C07C *107/02*; C08F *2/04, 2/24, 2/28*
U.S. Cl. 260—192 **22 Claims**

1. A process for the preparation of 2,2'-azobis(2,4-dimethyl-4-methoxypentanenitrile) comprising:
(a) reacting at a temperature of from −10° C. to 30° C.;
(i) 2-amino-2,4-dimethyl-4-methoxypentanenitrile;
(ii) a 5 to 11% by weight aqueous metal hypochloride solution containing 20–50 g of excess base per liter and a maximum metal chlorate content of 0.6% by weight based on a 15% by weight aqueous metal hypochlorite solution;
(iii) an ionic organic or inorganic bromide compound; and
(iv) at least 1.25% by weight based on the pentanenitrile of a quaternary ammonium compound of the formula



where R_1, R_2, R_3 and R_4 are each alkyl groups of 1–14 carbon atoms and where at least two alkyl groups of 6–14 carbon atoms are present with a total number of carbon atoms of 16–30 and X is bromide, chloride, hydroxide, acetate, formate or any other anionic group which does not deleteriously affect the performance of the quaternary ammonium cation, provided that if X is bromide, component (iii) need not be present; the equivalent ratio of (ii) to (i) being from 1.4:1 to 2:1 and of bromide ion to (iv) being from 0.4:1 to 4.0:1, and
(b) recovering the 2,2'-azobis(2,4-dimethyl-4-methoxypentanenitrile) produced.

4,218,372

AZO COMPOUNDS HAVING A β-ALKYNYLOXY CARBONYLALKYL GROUP ON THE COUPLING COMPONENT RADICAL

Klaus Koerte, Ettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

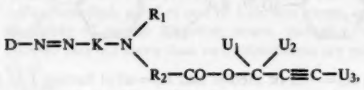
Filed Nov. 21, 1977, Ser. No. 853,531

Claims priority, application Switzerland, Aug. 12, 1977, 9907/77

Int. Cl.[2] C09B 29/36

U.S. Cl. 260—196 15 Claims

1. A compound of the formula

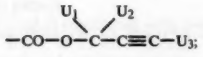


wherein

D is a diazo component radical of the benzene, pyrazole, thiophene, thiazole, isothiazole or thiadiazole series,

K is 1,4-phenylene, substituted 1,4-phenylene or 1,4-naphthylene,

R_1 is hydrogen; C_{1-4}alkyl; C_{1-4}alkyl monosubstituted by chloro, bromo, vinylsulfonyl, hydroxy, cyano, C_{1-2}alkoxy, phenyl, acetyl, phenoxy, formyloxy, (C_{1-3}alkyl)carbonyloxy, benzoyloxy, (C_{1-2}alkoxy)carbonyl, (C_{1-2}alkoxy)carbonyloxy, (C_{1-2}alkyl)carbamoyl, di-(C_{1-2}alkyl)carbamoyl or

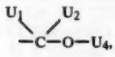


C_{3-4}alkyl substituted by hydroxy and one further substituent selected from the group consisting of chloro, C_{1-4}alkoxy, hydroxy, phenoxy and benzyloxy; C_{2-4}alkenyl; C_{3-4}chloroalkenyl or C_{3-4}bromoalkenyl, with the proviso that R_1 must be hydrogen or C_{1-4}alkyl when K is 1,4-naphthylene, wherein U_1, U_2 and U_3 are as defined below,

R_2 is straight or branched chain C_{1-4}alkylene or $—CH_2CH_2—O—CH_2CH_2—$,

Each of U_1 and U_2 is independently hydrogen or C_{1-4}alkyl or U_1 and U_2 taken together and with the carbon atom to which they are joined form a cyclohexyl ring, and

U_3 is hydrogen or



wherein U_1 and U_2 are as defined above, and U_4 is hydrogen, C_{1-4}alkyl or (C_{1-4}alkyl)carbonyl, with the proviso that when U_1 and U_2 taken together and with the carbon atom to which they are joined form a cyclohexyl ring, any —C≡C—U_3 group attached to the carbon atom to which said U_1 and U_2 are joined must be —C≡C—H,

with the proviso that the molecule is free of acetal groups.

4,218,373

WATER-SOLUBLE PHENYLAZOAMINONAPHTHOL SULPHONIC ACID DYESTUFFS

Gerhard Wolfrum, Leverkusen; Erich Klauke, Odenthal, and Hans-Günter Otten, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

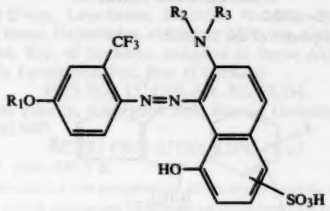
Filed Jun. 21, 1978, Ser. No. 917,572

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2728073

Int. Cl.[2] C09B 29/30; D06P 1/06, 1/39, 3/24

U.S. Cl. 260—198 4 Claims

1. A water-soluble monoazo dyestuff which, in the form of the free acid, corresponds to the formula



wherein

R_1 denotes alkyl alkyl mono-substituted by chlorine, hydroxyl, C_1 to C_4 alkoxy, cyano, phenyl or tolyl, cyclohexyl cyclohexyl substituted by C_1–C_4-alkyl, phenyl C_1–C_4-alkyl phenyl, chlorophenyl, bromophenyl, trifluoromethylphenyl or napthyl, alkenyl or benzenesulphonyl benzenesulphonyl substituted by fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_2 denotes hydrogen, C_1–C_4-alkyl C_1–C_4-alkyl substituted by hydroxyl, cyano, formylamino, C_1–C_4 alkylcarbonylamino or benzoylamino, C_1–C_4-alkyl- carbonylamino or benzoylamino; substituted by methyl, chlorine, bromine or trifluoromethyl; cyclohexyl or phenyl, cyclohexyl or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, bromine, or trifluoromethyl and

R_3 denotes hydrogen or C_1–C_4-alkyl.

4,218,374

PENAM DERIVATIVES

Takashi Kamiya, Suita; Tsutomu Teraji; Masashi Hashimoto, both of Toyonaka; Osamu Nakaguti, Osaka, and Teruo Oku, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

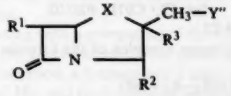
Division of Ser. No. 867,623, Jan. 6, 1978, which is a division of Ser. No. 648,491, Jan. 12, 1976, Pat. No. 4,084,049, which is a division of Ser. No. 407,962, Oct. 19, 1973, Pat. No. 3,954,732. This application Apr. 23, 1979, Ser. No. 32,294

Claims priority, application Japan, Nov. 8, 1972, 47-112348; Dec. 12, 1972, 47-1201; Dec. 12, 1972, 47-128657; Dec. 20, 1972, 47-128659; Dec. 22, 1972, 47-2270; Aug. 1, 1973, 48-87108

Int. Cl.[2] C07D 499/42

U.S. Cl. 260—245.2 R 4 Claims

1. A compound of the general formula:



wherein R^1 is amino, R^2 is carboxy or a conventionally protected carboxy, X is —S— or

R^3 is lower alkyl and Y'' is thiocyanato.

4,218,375

4H-THIENO-[3,2-B][1]-BENZAZEPINES

Lucien Nedelec, Le Raincy; Jacques Guillaume, Aulnay-sous-Bois, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

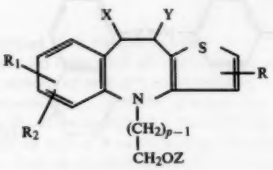
Filed Jun. 30, 1976, Ser. No. 701,152

Claims priority, application France, Jul. 10, 1976, 75 21649

Int. Cl.[2] C07D *513/02*

U.S. Cl. 260—330.3 **2 Claims**

1. A compound of the formula



wherein R, R_1 and R_2 are individually selected from the group consisting of halogen and hydrogen, X and Y are hydrogen or together form a carbon-carbon double bond, p is 2 or 3 and Z is selected from the group consisting of 2-tetrahydropyran, hydrogen and $-SO_2B$ wherein B is lower alkyl or monocyclic aryl.

4,218,376

PROCESS FOR PRODUCING HIGHLY CHLORINATED COPPER PHTHALOCYANINE

Ryo Matsuura, Yamato; Tomio Segawa; Yukio Nomiyama, both of Yokohama; Yoichi Kumada, Zushi, and Hideo Sawada, Yokohama, all of Japan, assignors to Kawasaki Kasei Chemicals Limited, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,711

Claims priority, application Japan, Dec. 12, 1977, 52-148081

Int. Cl.[2] C09B *47/10*

U.S. Cl. 260—314.5 **8 Claims**

1. A process for producing a highly chlorinated copper phthalocyanine which comprises charging chlorine under an elevated pressure of 1 to 20 Kg/cm^2 (gauge) into a chlorosulfonic acid solution of a copper phthalocyanine which contains 7 to 200 wt.% of a catalyst of sulfur or sulfur chloride as sulfur (based on chlorosulfonic acid) to form pyrosulfuryl chloride under an elevated pressure of 1 to 20 Kg/cm^2 (gauge).

4,218,377

METAL SALT/AMINE COMPLEXES

Friedrich Stockinger, Hölstein; Sameer H. Eldin, Birsfelden, and Friedrich Lohse, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 31, 1978, Ser. No. 956,521

Claims priority, application Switzerland, Nov. 4, 1977, 13447/77

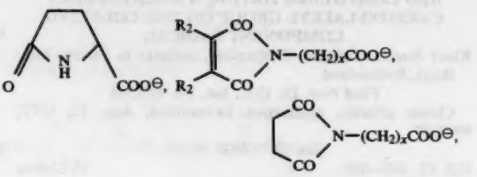
Int. Cl.[2] C07D *403/02*

U.S. Cl. 260—326.22 **6 Claims**

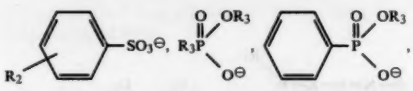
1. A metal salt/amine complex of the formula I

(I)

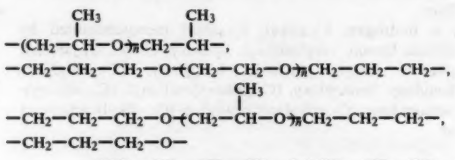
wherein A denotes an anion of the formula selected from the group consisting of



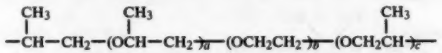
in which x=a number from 1 to 5 in each case and R_2=—H or methyl,



in which R_2=—H or methyl and R_3=alkyl having 1 to 4 C atoms in each case, and N≡C—CH_2—$COO^{\ominus}$, Me^{2+} denotes a divalent metal cation selected from the group consisting of Zn, Co, Cu, Ni and Cd and R_1 is a polyoxyalkylene radical of the formula selected from the group consisting of



in which n=a number from 2 to 35 in each case, and



in which b=a number from 10 to 50 and the sum of a and c is a number from 2 to 4.

4,218,378

11A-METHANO-TXA COMPOUNDS

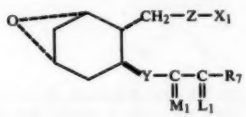
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 1, 1979, Ser. No. 35,143

Int. Cl.[2] C07D *301/00, 303/00;* **C09F** *5/08;* **C11C** *1/00*

U.S. Cl. 260—333 **89 Claims**

1. A thromboxane analog of formula



wherein Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —CH_2CH_2—, or

(4) —C≡C—,

wherein M_1 is αR_5:β-OH, αOH:β-R_5, or α-H:βH, wherein R_5 is hydrogen or methyl, and wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and β-R_3:α-R_4, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or differ-

ent, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro, or wherein $-C(M_1)-C(L_1)-$ is trans—CH=CH—; wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$$CH_2$—,
(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—, or
(8) trans—CH_2—$(CH_2)_g$—CH_2—CH=CH—;
(9) —(m—Ph)—O—$(CH_2)_g$—, or
(10) —(m—Ph)—CH_2—$(CH_2)_g$—,

wherein g is one, 2, or 3 and —(m—Ph)— is meta-phenylene; wherein R_7 is

(1) —$(CH_2)_m$—CH_3, wherein m is an integer from one to 5, inclusive;
(2) phenoxy;
(3) phenoxy substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and wherein X_1 is —$COOR_1$, wherein R_1 is

(a) hydrogen;
(b) alkyl of one to 12 carbon atoms, inclusive;
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(d) aralkyl of 7 to 12 carbon atoms, inclusive;
(e) phenyl;
(f) phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms;
(g) phenyl substituted in the para position by
(i) —NH—CO—R_{25}
(ii) —CO—R_{26}
(iii) —O—CO—R_{27}
(iv) —CH=N—NH—CO—NH_2

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; and R_{27} is phenyl or acetamidophenyl; inclusive, or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

4,218,379

PROCESS FOR THE PRODUCTION OF MACROCYCLIC ESTERS

Eugene G. Harris, West Chester, Ohio, and John F. White, Princeton, N.J., assignors to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 835,253, Sep. 21, 1977, Pat. No. 4,165,321. This application Dec. 18, 1978, Ser. No. 970,617

Int. Cl.[2] C07D *323/00, 327/00, 321/00, 313/00*

U.S. Cl. 260—340.2 **12 Claims**

1. In a process for the production of heteromacrocyclic compounds selected from the group consisting of cyclic esters and lactones having 8 to 20 carbon atoms in the ring by depolymerization of a linear polyester and ring closure at an elevated temperature and reduced pressure and in the presence of a metal catalyst, the improvement comprising conducting the process as a continuous or semi-continuous operation in the presence of 0.75 to 10 mole percent monocarboxylate derived from an aromatic monocarboxylic acid having 7 to 30 carbon atoms and with agitation which provides top-to-bottom mixing throughout essentially the total volume of the reaction mass in an inverted multiple-blade conical vessel wherein the blades have a helical configuration and are arranged to rotate throughout essentially the entire reaction mass and in close proximity to the interior surface of said conical vessel and in a direction which provides a downward flow within the reaction mixture.

4,218,380

PROCESS FOR THE PREPARATION OF ARYLGLYOXYLIC ACIDS

Helmut Fiege, Leverkusen; Karlfried Wedemeyer, Cologne; Kurt Bauer, Holzminden, and Reiner Mölleken, Golmbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

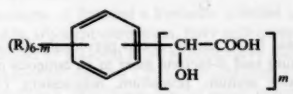
Filed May 11, 1979, Ser. No. 38,154

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824407

Int. Cl.[2] C07D *317/06;* C07C *51/33*

U.S. Cl. 260—340.5 R **31 Claims**

1. Process for the preparation of an arylglyoxylic acid compound which comprises oxidizing an α-hydroxyarylacetic acid of the formula



(I)

in which

m is 1, 2 or 3,

each R individually is hydrogen, alkyl, cycloalkyl, aryl, aralkyl, alkoxy, cycloalkoxy, aryloxy, hydroxyl, halogen, aminoalkyl or carboxyl,

with the proviso that

two R's together can represent the methylenedioxy group

which process comprises oxidizing said α-hydroxyarylacetic acid with oxygen or a gas containing molecular oxygen in aqueous alkaline medium in the presence of a catalyst comprising a platinum-group metal in the presence as an activator of at least one of lead, a lead compound, bismuth and a bismuth compound at a temperature of up to the boiling point of the resulting reaction mixture.

4,218,381

NOVEL ESTER DERIVATIVES OF POLYCARBOXYLIC ACIDS AND PROCESS FOR MAKING SAME

Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

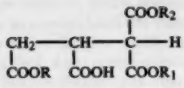
Division of Ser. No. 642,850, Dec. 22, 1975, Pat. No. 4,123,458. This application May 15, 1978, Ser. No. 905,621

Int. Cl.[2] C07D *307/32;* C07C *51/09, 51/38*

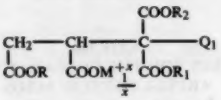
U.S. Cl. 260—343.6 **9 Claims**

1. A process for preparing a mixture of isocitric acid, alloisocitric acid and lactones of isocitric acid and alloisocitric acid comprising:

(a) halogenating with a compound of the formula $M_1O/x\ Q_1$ wherein M_1 is hydrogen or an alkali metal or alkaline earth metal cation, x is either 1 or 2 and corresponds to the valency of M_1, and Q_1 is chlorine or bromine, in an aqueous medium at a pH of less than about 8, a compound of the general formula

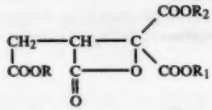


wherein R, R_1 and R_2 are independently primary alkyl groups of 1 to 4 carbon atoms; to produce a halogenated compound of the general formula



wherein said R, said R_1, said R_2, said M_1, said x and said Q_1 are as previously defined;

(b) heating said halogenating compound in an aqueous medium at a pH of about 8–9 and at a temperature of 25° to 75° C. to produce a β-lactone ester of the following general formula



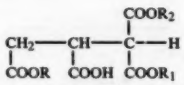
wherein said R, R_1 and R_2 are as previously defined;

(c) hydrolyzing said β-lactone ester in an aqueous medium with lithium, sodium, potassium, magnesium, calcium, strontium or barium hydroxide at a pH of about 9–11 to produce a hydrolysis reaction mixture; and

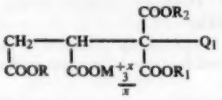
(d) acidifying said hydrolysis reaction mixture to a pH of less than about 2 to produce said mixture of isocitric acid, alloisocitric acid and lactones of isocitric acid and alloisocitric acid.

4. A process for preparing a mixture of isocitric acid, alloisocitric acid and lactones of isocitric acid and alloisocitric acid comprising:

(a) halogenating with a compound of the formula $M_3O/x\ Q_1$ wherein M_3 is hydrogen or an alkali metal or alkaline earth metal cation, x is 1 or 2 and corresponds to the valency of M_3, and Q_1 is chlorine or bromine, in an aqueous medium at a pH of less than about 8, a compound of the general formula

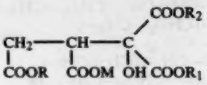


wherein R and R_2 are independently primary alkyl groups of 1 to 4 carbon atoms and R_1 is a primary alkyl group of 1 to 4 carbon atoms, a lithium, a sodium, or potassium cation; to produce a halogenated compound of the general formula



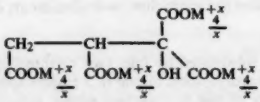
wherein said R, said R_1, said R_2, said M_3, said x and said Q_1 are as previously defined;

(b) heating said halogenated compound in an aqueous medium containing a compound of the formula M_2CO_3 wherein M is lithium, potassium or sodium, at a pH of about 7–9 to produce a hydroxy substituted tetracarboxylic compound of the general formula



wherein R, R_1, R_2, and M are as previously defined;

(c) hydrolyzing said hydroxy substituted tetracarboxylic compound in an aqueous medium with a lithium, sodium, or potassium hydroxide or carbonate, or calcium, strontium or barium hydroxide at a pH of about 9–11 to produce a tetracarboxylic compound having the general formula

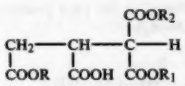


wherein M_4 is lithium, sodium, potassium, calcium, strontium or barium, and x is the valency of M_4; and

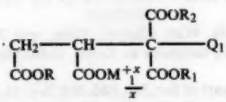
(d) acidifying the aqueous solution to a pH of less than about 2 to produce said mixture of isocitric acid, alloisocitric acid and lactones of isocitric acid and alloisocitric acid.

7. A process for preparing a mixture of isocitric acid, alloisocitric acid and lactones of isocitric acid and alloisocitric acid comprising:

(a) halogenating with a compound of the formula $M_1O/x\ Q_1$ wherein M_1 is hydrogen or an alkali metal or alkaline earth metal cation, x is either 1 or 2 and corresponds to the valency of M_1 and Q_1 is chlorine or bromine, in an aqueous medium at a pH of less than about 8, a compound of the general formula



wherein R and R_2 are independently primary alkyl groups of 1 to 4 carbon atoms and R_1 is a primary alkyl group of 1 to 4 carbon atoms, a lithium, a sodium, or potassium cation; to produce a halogenated compound of the general formula



wherein said R, said R_1, said R_2, said M_1, said x and said Q_1 are as previously defined;

(b) heating said halogenated compound in an aqueous medium containing $Mg(OH)_2$ at a pH of about 7–9 to produce an aqueous reaction mixture of magnesium isocitrate and magnesium alloisocitrate; and

(c) acidifying the aqueous reaction mixture to a pH of less than about 2 to produce said mixture of isocitric acid, alloisocitric acid and lactones of isocitric acid and alloisoctric acid.

4,218,382

PRODUCTION OF MALEIC ANHYDRIDE FROM FOUR-CARBON HYDROCARBONS USING CATALYSTS PREPARED BY WATER REFLUX TECHNIQUES

Ernest C. Milberger, Solon; Serge R. Dolhyj, Parma, and Noel J. Bremer, Kent, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Oct. 23, 1978, Ser. No. 954,056
Int. Cl.[2] C07D 307/60
U.S. Cl. 260—346.75 21 Claims

1. In a process for the production of maleic anhydride by the oxidation of n-butane, n-butenes, 1,3-butadiene or a mixture thereof with molecular oxygen in the vapor phase at a reaction temperature of 250° C. to 600° C. in the presence of a catalyst comprising the mixed oxides of vanadium, phosphorus and uranium, the improvement wherein the catalyst is prepared by

(a) forming an aqueous oxide slurry of a vanadium compound containing pentavalent vanadium;

(b) adding to said aqueous oxide slurry a mineral acid-free, inorganic reducing agent capable of reducing said pentavalent vanadium to a valence state below +5 to obtain an aqueous slurry containing reduced vanadium, wherein said reducing agent is selected from the group consisting of ammonia, hydrazine, hydrazine hydrate, a finely divided metal or colloidal metal;

(c) adding a compound containing uranium immediately before the addition of the reducing agent or after the addition of the reducing agent;

(d) adding a phosphorus compound containing pentavalent phosphorus before the addition of the reducing agent or after the addition of the reducing agent;

(e) heating said aqueous oxide slurry under reflux conditions;

(f) removing the water from the resulting slurry to form a dried catalyst; and

(g) calcining the dried catalyst at a temperature of 250° C. to 600° C.

4,218,383

METHOD OF PRODUCING MALEIC ANHYDRIDE

Edwin J. Strojny, Midland, Mich.; Hans R. Friedli, and Milton S. Wing, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 828,409, Aug. 29, 1977, Pat. No. 4,113,745.
This application May 22, 1978, Ser. No. 908,027
Int. Cl.[2] C07D 307/60
U.S. Cl. 260—346.75 1 Claim

1. A process for preparing maleic anhydride which comprises treating a crude C_5 stream at a temperature of from 80° C. to 100° C. for from about 8 to 32 hours, removing dicyclopentadiene and its codimers by distillation and recovering piperylene from the overhead by distillation or extraction distillation, feeding said piperylene with an oxygen or an oxygen-containing gas, into a reaction zone containing a catalyst which comprises a mixture of vanadium oxide, molybdenum oxide, and titanium oxide supported on an inert carrier in an amount to supply from 3–20 weight percent of the mixture having a ratio of $V_2O_5/MoO_3/TiO_2$ of 25 to 60 weight percent V_2O_5, 5 to 40 weight percent MoO_3, 30 to 60 weight percent TiO_2, wherein the source of the vanadium oxide for the catalyst is the compound vanadium pentoxide said carrier being alumin-silica or α-alumina having a surface area of less than about 1 square meter per gram, calcined at about 500° C. over a 2- to 6-hour period and maintaining said reactor and contents at a temperature between about 380° C. to about 450° C., maintaining said stream feed to said reactor and said oxygen at a gas hourly space velocity per hour ($GHSV/hr^{-1}$) at from between about 1,500 and about 15,000 said C_5 stream being from 0.5 to 1.5 volume percent of said total feed, withdrawing said products, cooling said product stream to condense the organic fraction therefrom, and recovering the maleic anhydride from said condensed fraction.

4,218,384

OMEGA-AMINO ALKENOIC ACIDS

Francesco Siclari, Barlassina Milan, and Pietro P. Rossi, Garlasco Pavia, both of Italy, assignors to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Division of Ser. No. 486,992, Jul. 10, 1974, Pat. No. 4,085,127.
This application Mar. 13, 1978, Ser. No. 885,608
Claims priority, application Italy, Jul. 11, 1973, 26479 A/73
Int. Cl.[2] C09F 5/00; C11C 3/00
U.S. Cl. 260—404 15 Claims

1. An omega amino alkenoic acid containing from 8 to 12 carbon atoms, and selected from the group consisting of 12-amino-4,8-dodecadienoic acid, 12-amino-4-do-decenoic acid, 12-amino-8-dodecenoic acid, 8-amino-4-octenoic acid, 10-amino-4-decenoic acid, 10-amino-6-decenoic acid, and mixtures thereof.

4,218,385

TRI-SUBSTITUTED, HYDROCARBON SOLUBLE, CHROMIUM COMPOUND SYNTHESIS

Roscoe A. Pike, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 7, 1978, Ser. No. 958,471
Int. Cl.[2] C09F 7/00; C11C 3/12, 1/00
U.S. Cl. 260—408 5 Claims

1. A process of forming a kerosene solution of a hydrocarbon soluble, trivalent chromium, fatty acid compound particularly adapted to perform as an anticorrosive fuel soluble additive, comprising reacting CrO_3, concentrated HCl, methanol, isopropanol and naphthenic acid in water containing 2,4-pentanedione thereby forming a Werner complex of the acid, chromium, and HCl supplied chloride, the methanol and isopropanol being present in an amount at least 7.5 times that necessary to reduce the CrO_3, and the naphthenic acid being present in an amount about one-third the stoichiometric amount of fatty acid necessary to form the trivalent chromium compound, adding kerosene to the complex containing composition, adding more water, concentrated ammonium hydroxide and 2-ethylhexanoic acid to the composition to react with the complex thereby forming a trivalent chromium fatty acid compound dissolved in the added kerosene, separating the water from the composition, and washing the resulting kerosene layer with a one percent solution of ammonium chloride resulting in a kerosene solution of the chromium compound having a chromium metal content of about 5 to 8% and a viscosity less than 500 cs.

4,218,386

HYDROLYSIS OF TRIGLYCERIDES

Ted J. Logan; David C. Underwood, and Tom C. Rheinecker, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 15, 1978, Ser. No. 915,645
Int. Cl.[2] C11C 1/04, 1/00
U.S. Cl. 260—415 23 Claims

1. A process for hydrolyzing triglyceride having its carboxylic acid moieties containing from 6 to 26 carbon atoms, said process comprising

reacting said triglyceride with water in the presence of displacing acid catalyst, strong acid catalyst and sufficient water to form water and oil phases to produce carboxylic acids corresponding to said moieties and glycerine; and recovering displacing acid catalyst.

4,218,387

PREPARATION OF CATALYTIC COPPER AND PRODUCTION OF ORGANOCHLOROSILANE USING SAID COPPER

Joachim Maas, Bergheim; Rudolf Mundil, Leverkusen; Bruno Degen, Bergisoh-Gladbach, and Hans-Heinrich Moretto, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 953,047

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750556

Int. Cl.[2] B01J *23/72*; C07F *7/16*

U.S. Cl. 556—412 7 Claims

1. In the preparation of catalytic copper with an average particle size between about 0.1 and 100 microns and a copper-I oxide content of about 3 to 100% by oxidation of a Cu powder, the improvement which comprises carrying out the oxidation with oxygen at a reduced partial pressure compared with that of air, the resulting catalyst being of enhanced catalytic activity.

4,218,388

PROCESS FOR PREPARING HYDROCARBONS FROM GASIFICATION OF COAL

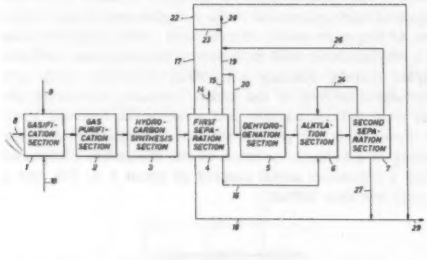
Lambert Schaper, Amsterdam; Bernardus J. Runderkamp, The Hague; Swan T. Sie, Amsterdam, and Nicoline W. Spakman, The Hague, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 11, 1978, Ser. No. 968,324

Claims priority, application United Kingdom, Dec. 22, 1977, 53503/77

Int. Cl.[2] C07C *3/50*, *1/04*

U.S. Cl. 260—449 R 1 Claim



1. A process for preparing liquid hydrocarbons from coal, comprising:

(a) converting coal into a mixture of carbon monoxide and hydrogen by gasification at a temperature between 1050° C. and 2000° C.;

(b) converting the mixture of carbon monoxide and hydrogen into an aromatic hydrocarbon mixture in the presence of a catalyst which contains a crystalline aluminosilicate zeolite having an SiO_2/Al_2O_3 molar ratio of at least 12 and a constraint index between 1 and 12;

(c) separating from the aromatic hydrocarbon mixture an isobutane-containing gaseous fraction and an aromatic liquid fraction boiling in the gasoline range;

(d) converting the isobutane-containing gaseous fraction by alkylation into a product from which a fraction boiling in the gasoline range is separated; and

(e) mixing the two fractions boiling in the gasoline range obtained according to (c) and (d).

4,218,389

PROCESS FOR MAKING METHANOL

Robert G. Jackson, and Richard M. Tillman, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Jan. 28, 1977, Ser. No. 763,395

Int. Cl.[2] C07C *31/06*

U.S. Cl. 260—449.5 6 Claims

1. A process for producing methanol from solid carbonaceous material comprising:

subjecting said carbonaceous material to an air-blown gasification step to produce a feed gas stream comprising nitrogen, hydrogen, carbon monoxide, carbon dioxide and methane;

reacting said feed gas stream in a reactor to produce an effluent gas stream containing methanol;

condensing methanol from said effluent gas stream and withdrawing condensed methanol therefrom;

scrubbing carbon monoxide from said effluent gas stream;

condensing the higher boiling components from said effluent gas stream after carbon monoxide scrubbing to produce a recycle gas stream which is predominantly hydrogen;

combining said predominantly hydrogen recycle gas stream with carbon monoxide previously scrubbed from said effluent gas stream;

combining said recycle gas stream including carbon monoxide with said feed gas stream to provide a combined feed gas stream and recycle gas stream including recycle carbon monoxide for introduction to said reactor, said combined feed gas stream and recycle gas stream having a nitrogen content of less than 25 volume percent; and

introducing said combined feed gas stream and recycle gas stream into said reactor.

4,218,390

METHOD FOR PREPARING BIURET-STRUCTURE POLYISOCYANATES

Mikhail G. Brusilovsky, Krymsky val, 8, kv. 56, Moscow; Valentin P. Krasnokutsky, Novouglicheskoe shosse, 65, kv. 51, Zagorsk; Galina I. Nemtinova, Leningradskee shosse, 48, kv. 151; Evgeny N. Novozhilov, Tulinskaya ulitsa, 18/2, kv. 1, both of Moscow; Viktor A. Pekarsky, ulitsa Kirova, kvartal 116, 24, kv. 30, Ljubertsy Moskovskoi oblasti; Svetlana A. Platonova, ulitsa Verkhnyaya, 22, Bykovo Moskovskoi oblasti, and Alexandr S. Tumansky, Vyborskaya ulitsa, 10, kv. 71, Moscow, all of U.S.S.R.

Filed May 9, 1979, Ser. No. 37,481

Int. Cl.[2] C07C *127/24*

U.S. Cl. 260—453 AB 1 Claim

1. A method for preparing biuret-structure polyisocyanates comprising reacting 1,6-hexamethylenediisocyanate at a temperature ranging from 150° to 170° C. with water which is delivered into the reaction zone in the form of vapours in a mixture with a gas selected from the group consisting of air and an inert gas at a moisture content of said mixture ranging from 0.1 to 2.0 kg/kg and temperature of from 110° to 130° C.

4,218,391

METHOD FOR THE PREPARATION OF ESTERS OF CARBONIC ACID

Ugo Romano; Renato Tesei; Gioacchino Cipriani, and Lidio Micucci, all of Milan, Italy, assignors to Anic, S.p.A., Italy

Continuation of Ser. No. 832,628, Sep. 12, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,332

Claims priority, application Italy, Sep. 30, 1976, 27825 A/76

Int. Cl.[2] C07C *68/00*

U.S. Cl. 260—463 7 Claims

1. A method for the preparation of carbonic acid esters of formula $(RCO)_2O$ wherein R is an alkyl or cycloalkyl radical, said method comprising reacting an alcohol of the formula ROH wherein R is as described above, with oxygen and carbon monoxide in the presence of a catalyst consisting of a

copper metal salt of the group of cuprous salts and cupric salts having a single inorganic anion.

4,218,392

TWO-STEP METHOD OF MAKING COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER 2-CYANO-3,3-DIPHENYLACRYLOXY) ALKYLENE ACRYLIC ACID ESTERS

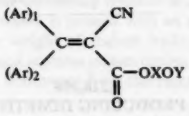
Donald H. Lorenz, Basking Ridge, and Bruce A. Gruber, Bloomingdale, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 6,787, Jan. 26, 1979, Pat. No. 4,178,303. This application May 16, 1979, Ser. No. 39,561

Int. Cl.² C07C *121/70*

U.S. Cl. 260—465 D **7 Claims**

1. A method of making copolymerizable ultraviolet light absorber (2-cyano-3,3-diphenylacryloxy) alkylene acrylic acid esters in high yield having the formula:



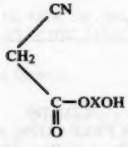
where

$(Ar)_1$ and $(Ar)_2$ are aromatic carbocyclic nuclei of the benzene and naphthalene series and are independently selected from phenyl or phenyl substituted with alkyl, halo, alkoxy, carboxy, carbalkoxy, cyano, acetyl, benzoyl, phenyl, alkyl phenyl, phenoxy phenyl, alkyl substituted phenoxy, or alkoxy phenyl substituted phenyl, and naphthyl;

X is alkylene, C_2–C_{17}, unsubstituted or substituted with halo, cyano, alkyl C_1–C_6, alkoxy C_1–C_6, alkoxyalkyl C_1–C_6, or alkoxyalkyleneoxy C_1–C_6; and,

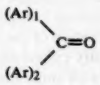
Y is copolymerizable radical selected from acryloyl C_3–C_{12}, alkylacryloyl C_3–C_{12}, acryloxyalkyl C_3–C_{12}, acryloxyhydroxyalkyl and alkylacryloxyhydroxyalkyl C_3–C_{12}, which comprises the steps of:

(a) esterifying a hydroxyalkylene cyanoacetate having the formula:



where X is as defined above, with an acryloyl halide or acrylic acid having the formula YZ, where Y is as defined above and Z is a halide or hydroxyl group to form a (2-acryloxyalkyl) 2-cyanoacetate intermediate, and,

(b) condensing the intermediate with a benzophenone having the formula:



where $(Ar)_1$ and $(Ar)_2$ are as defined above, to form the desired compound.

4,218,393

MANUFACTURE OF VINYL-LACTONITRILE

Michael Kröner, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

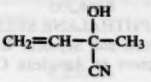
Filed Nov. 30, 1977, Ser. No. 855,877

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655715

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.6 **10 Claims**

1. A process for the manufacture of vinyl-lactonitrile of the formula



I,

comprising:

reacting methyl vinyl ketone with from 1 to 1.2 moles of hydrogen cyanide per mole of methyl vinyl ketone in the presence of an effective amount of at least one basic compound as a catalyst selected from the group consisting of alkali metal compound, alkaline earth metal compound, and tertiary amine at a temperature from 0° to −50° C., in the presence of:

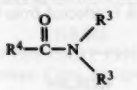
from 300 to 1000 percent by weight, based on methyl vinyl ketone, of a compound which is an alkanol of 9 to 12 carbon atoms, or in the presence of:

from 50 to 500 percent by weight, based on methyl vinyl ketone, of ω-chloroalkanol of 1 to 4 carbon atoms, or in the presence of:

from 50 to 1000 percent by weight, based on methyl vinyl ketone, of diol or ether diol of 2 to 6 carbon atoms, or in the presence of:

from 100 to 1000 percent by weight, based on methyl vinyl ketone, of diol or ether diol of 7 to 12 carbon atoms, or in the presence of:

from 50 to 500 percent by weight, based on methyl vinyl ketone, of carboxylic acid amides of the formula



III,

where the individual radicals R^3 and R^4 are identical or different and each is hydrogen or an alkyl of 1 to 4 carbon atoms and R^4 together with one radical R^3 may also be $—CH_2—CH_2—CH_2—$, or in the presence of:

from 50 to 500 percent by weight, based on methyl vinyl ketone, of dimethylsulfoxide, or in the presence of:

from 3 to 30 percent by weight of water, based on methyl vinyl ketone, or mixtures of the above.

4,218,394

PREPARATION OF UNSATURATED NITRILES

Charles A. Drake, and Willie W. Crouch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1979, Ser. No. 32,976

Int. Cl.² C07C *120/00, 121/46, 121/20, 121/66*

U.S. Cl. 260—465.8 R **24 Claims**

1. A process which comprises contacting at least one olefinic hydrocarbon reactant, at least one olefinically unsaturated mononitrile reactant and at least one monoadduct reaction product of an olefinic hydrocarbon compound and an olefinically unsaturated mononitrile compound, in a tubular reactor in the presence of a diluent, under reaction conditions suitable to produce at least one olefinically unsaturated dinitrile product, each of said olefinically unsaturated mononitrile reactant and said olefinically unsaturated mononitrile compound containing at least one hydrogen atom attached to a doubly

bonded carbon atom and containing a cyano group attached to a carbon atom adjacent and doubly bonded to a carbon atom which is attached to at least one hydrogen atom, each of said olefinic hydrocarbon reactant and said olefinic hydrocarbon compound having at least one olefinic linkage having joined to one of the doubly bonded carbons a carbon atom having at least one hydrogen atom attached thereto, wherein at substantially any point in said tubular reactor the concentration of said monoadduct reaction product in the resulting reaction mixture is within the range of about 10 to about 90 weight percent of the total reaction mixture.

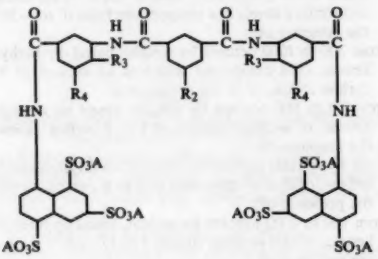
4,218,395

UREYLENE NAPHTHALENE SULFONIC ACIDS

John F. Poletto, Nanuet, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 812,192, Jul. 1, 1977, Pat. No. 4,120,891.
This application Aug. 28, 1978, Ser. No. 937,369
Int. Cl.[2] C07C *143/53*
U.S. Cl. 260—507 R **7 Claims**

1. A compound of the formula:



wherein R_2 is selected from the group consisting of nitro and amino; R_3 is selected from the group consisting of hydrogen and methyl; R_4 is selected from the group consisting of hydrogen and carboxyl; and A is selected from the group consisting of alkali metal.

4,218,396

PHENYLENE-BIS (SUBSTITUTED THIOUREAS)

Rudiger D. Haugwitz, and Barbara V. Maurer, both of Titusville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 29, 1976, Ser. No. 727,835
Int. Cl.[2] A61K *31/17*; C07C *157/09*
U.S. Cl. 260—552 R **4 Claims**

1. N,N''-[4-chloro-1,3-phenylene]bis[N',N'-bis-(1-methylethyl)thiourea].

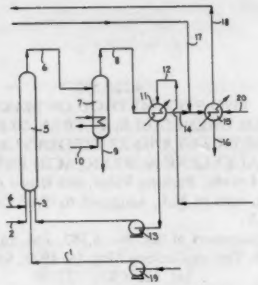
4,218,397

METHOD FOR ELIMINATING THE EXPLOSIBILITY OF TAIL GAS FROM THE UREA SYNTHESIS PLANT

Keizo Konoki, Tokyo, and Michio Nobue, Funabashi, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc. and Toyo Engineering Corporation, both of Tokyo, Japan

Filed May 17, 1979, Ser. No. 39,889
Claims priority, application Japan, May 20, 1978, 53/60365
Int. Cl.[2] C07C *126/02*
U.S. Cl. 260—555 A **1 Claim**

1. A method for eliminating the explosibility of tail gas from the urea synthesis process, which comprises the steps of: decomposing ammonium carbamate contained in the effluent from an urea synthesis reactor to produce a gaseous mixture; absorbing the ammonia and carbon dioxide contained in said gaseous mixture by a solvent and transferring the thus absorbed ammonia and carbon dioxide back into the urea synthesis reactor; and adding to the residual gas mixture which has not been absorbed by the solvent a purge gas available from an ammonia synthesis circulating system to lower the oxygen



concentration in said residual gas mixture and keep the combustible gas concentration beyond the range of explosion.

4,218,398

PROCESS FOR PRODUCING DIMETHYLFORMAMIDE

Masao Saito; Kinichi Mizuno; Yuzi Onda; Tetsuo Aoyama, and Kumiko Kato, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 844,077, Oct. 20, 1977, abandoned.
This application Dec. 22, 1978, Ser. No. 972,257
Claims priority, application Japan, Nov. 1, 1976, 51-131527
Int. Cl.[2] C07C *103/36*
U.S. Cl. 260—561 R **4 Claims**

1. A process for producing dimethylformamide which comprises reacting a mixture of monomethylamine and trimethylamine with carbon monoxide at a temperature of from 150°–300° C. in the presence of at least one catalyst selected from the group consisting of iodine; bromine; ammonium iodide; ammonium bromide; iodides and bromides of copper, zinc, magnesium, calcium, strontium, barium, iron, cobalt, nickel, ruthenium, rhodium and palladium; hydriodic acid; hydrobromic acid; alkyl iodides and alkyl bromides, the amount of said catalyst being 1–500 mg-atom in terms of halogen per mole of raw material amine mixture.

4,218,399

METHOD FOR PREPARING α, ω-DIAMINES

Francesco Siclari, Barlassina; Pietro P. Rossi, Garlasco, and Mario De Gaetano, Cesano Maderno, all of Italy, assignors to SNIA VISDOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Feb. 23, 1979, Ser. No. 14,633
Claims priority, application Italy, Feb. 28, 1978, 20679 A/78
Int. Cl.[2] C07C *85/08, 85/24*
U.S. Cl. 260—583 P **5 Claims**

1. A method for preparing straight chain saturated or unsaturated aliphatic α, ω -diamines containing from 8 to 12 carbon atoms, by reductive amination of the corresponding α, ω -dialdehydes, comprising firstly converting a said α, ω -dialdehyde to di-imine by reaction with ammonia and then hydrogenating the so-obtained di-imine, the method being characterized in that the reaction of dialdehyde with ammonia is carried out in an aqueous mixture of butyl alcohol.

circuit leads for interconnecting said line voltage, converter means, bulb, battery means and relay;
case means for housing said light assembly, converter means, battery means, relay and current leads; and
switch means for disabling said relay whereby the status of said line voltage and said battery is instantly determined.

4,218,400

PROCESS FOR THE PRODUCTION OF FLUORENONE BY CATALYTIC OXIDATION OF FLUORENE

Carl Finger, Essen, Fed. Rep. of Germany, assignor to Rütgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,755
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704648
Int. Cl.² C07C *45/02*
U.S. Cl. 568—321 8 Claims

1. In a process for the production of pure flourenone by oxidation of flourene with air or oxygen at ambient temperature in the presence of a quanternary salt, the improvement which comprises carrying out the reaction in a suspension of flourene or a flourene-containing fraction in an aprotic water immiscible solvent which is primed with an aqueous solution containing 40% by weight of sodium hydroxide, intimately mixing the organic and aqueous phases during the reaction and separating the pure flourenone from the reaction mixture.

4,218,401

OXYDEHYDROGENATION OF ALCOHOLS

C. Elmer Wymore, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 11, 1974, Ser. No. 432,702
Int. Cl.² C07C *45/16*
U.S. Cl. 567—402 10 Claims

1. The process of producing an aldehyde or ketone by the oxydehydrogenation of a primary or secondary alcohol, respectively, comprising contacting a gaseous feed containing elemental oxygen and the alcohol with a supported catalyst consisting essentially of Ru, Rh, Pd, Pt, Ir, Os or a combination thereof at a temperature of about 225°–600° C.

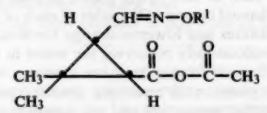
4,218,402

PREPARATION OF 2,2-DIMETHYL-3-((OXYIMINO)METHYL)CYCLOPROPANECARBOXYLIC ACIDS

Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 16, 1979, Ser. No. 57,632
Int. Cl.² C07C *131/02*
U.S. Cl. 260—546 8 Claims

1. A compound of the formula



wherein R^1 represents an alkyl group containing from 1 to 10 carbon atoms optionally substituted by one or more halogen atoms, a (cycloalkyl)alkyl group containing from 3 to 7 ring carbon atoms, a total of from 4 to 9 carbon atoms and optionally ring-substituted by one or more halogen atoms, a cycloalkyl group containing from 3 to 7 ring carbon atoms, an alkenyl group containing from 3 to 4 carbon atoms optionally substituted by one or more halogen atoms or alkynyl group containing from 3 to 4 carbon atoms or an aryl group containing from 6 to 12 carbon atoms or an aralkyl group containing from 7 to 10 carbon atoms, each optionally ring-substituted by one or more halogen atoms.

4,218,403

SYNTHESIS OF AROMATIC ALDEHYDES

Steven H. Vanderpool, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Apr. 6, 1979, Ser. No. 27,580
Int. Cl.² C07C *45/02*
U.S. Cl. 568—428 9 Claims

1. A method for preparing a para-alkyl monosubstituted phenyl aldehyde which comprises the step of reacting under superatmospheric pressure carbon monoxide and an alkyl-substituted benzene in presence of a catalyst comprising hydrogen fluoride and a pentafluoride selected from the group consisting of TaF_5, NbF_5 and SbF_5.

4,218,404

ω-AMINOCARBOXYLIC ACID AMIDES

László Feuer; Arpad Furka; Ferenc Sebestyen; Anikó Horváth, and Jolán Hercsel, nee Szepespataki, all of Budapest, Hungary, assignors to Chinoin Gyógyszer és Vegyészeti Termékek Gyára Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 792,917, May 2, 1977, Pat. No. 4,102,948. This application Mar. 8, 1978, Ser. No. 884,640
Claims priority, application Hungary, May 6, 1976, CI 1662
The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.
Int. Cl.² A61K *31/66;* C07F *9/09;* C07C *143/15, 143/53*
U.S. Cl. 260—944 13 Claims

1. A compound selected from the group consisting of:
N-acetyl-γ-aminobutyryl-taurine;
N-benzoyl-γ-aminobutyryl-taurine;
γ-aminobutyryl-homotaurine;
β-alanyl-homotaurine;
N-carbobenzoxy-γ-aminobutyryl-homotaurine;
N-carbobenzoxy-γ-aminobutyryl-ethanolamine phosphate;
N-carbobenzoxy-γ-aminobutyryl-propanolamine phosphate;
N-carbobenzoxy-β-alanyl-ethanolamine phosphate; and
N-carbobenzoxy-β-alanyl-propanolamine phosphate; or a pharmaceutically acceptable salt thereof.

4,218,405

HALOGENATED TERTIARY PHOSPHITE ESTERS

Richard J. Turley, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 26, 1978, Ser. No. 899,919
Int. Cl.² C07F *9/141;* C08K *5/53*
U.S. Cl. 260—967 2 Claims

1. The compound identified as tris-(1,4,4,4-tetrachloro-2-butyl) phosphite.

2. The compound identified as tris-(2,4,4,4-tetrachlorobutyl) phosphite.

4,218,406

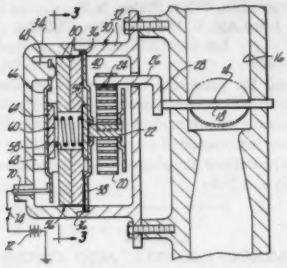
AUTOMATIC CHOKE CONTROL

Charles A. Detweiler, Durand, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed May 11, 1979, Ser. No. 37,639
Int. Cl.² F02M *1/12*
U.S. Cl. 261—39 B 14 Claims

1. A choke control device for the carburetor of an internal combustion engine having a choke valve, the combination comprising; a bimetal coil having one end adapted to be connected to said choke valve to move said choke valve to a closed position when the temperature of said engine is low and to move said choke valve to a fully open position at a predetermined elevated temperature of said engine, heating means to heat said bimetal coil when said engine is operating, means forming a heat sink disposed in adjacent heat transfer relationship to said bimetal coil, said heat sink including a material operable to absorb latent heat to change the state of said material as a result of said predetermined elevated temperature of

said engine after said choke is in said fully open position and operable to return said latent heat to said coil during cooling of



said engine to resist cooling of said coil and delay closing of said choke valve.

4,218,407

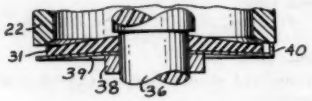
VALVED OR PROGRESSIVELY OPENING SPARGER WITH RIGID UPPER SEAT

Louis Robertson, 1411 Nashua Cir., Sun City Center, Fla., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Continuation of Ser. No. 26,358, Apr. 7, 1970, abandoned. This application Nov. 15, 1972, Ser. No. 306,886

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—64 R **5 Claims**



1. In a tank containing a body of liquid, and means for supporting therein a sparger submerged in said body of liquid, a valved sparger supported by said means, and including a rigid peripheral seat and a valve member having its periphery movable to close with respect to the seat, said movable valve periphery being so located as to be exposed during normal operation to the body of liquid while determining the distribution of air release about the sparger, characterized by:

said valving member having, at a selected minimum airflow volume which is appropriate for establishing above the sparger a vigorous air-lift column to break up bubbles therein to fine bubbles, a position at which the total effective orifice area is constricted to provide a back pressure equivalent to at least two inches of water column;

said sparger including yieldable stop means initially engaged by the valving member when it has opened to said position and preloaded to induce substantial equality of distribution of said orifice area about the seat before yielding to provide an increase of said area to accommodate greater flow with only moderate increase of the air pressure immediately upstream from the orifice area.

4,218,408

COOLING TOWER WITH RIPPLE PLATES

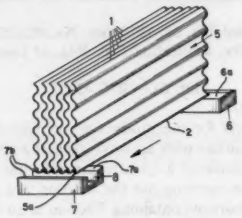
Herbert Henning, Velbert, and Siegfried Kliemann, Bochum, both of Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 763,022, Jan. 27, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,029

Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619407

Int. Cl.[2] F28F *25/08;* **F28C** *1/02*

U.S. Cl. 261—112 **7 Claims**



1. A cooling tower having corrugated ripple plates for a substantially vertical assembly in wet cooling towers or combined wet-dry cooling towers in counter-flow construction, of which the portion at the upper end, the corrugation and the spacing relative to the respective adjacent equally-formed ripple plate are formed such that cooling water which is distributed from a distribution device above the ripple plates runs down on both surfaces of the ripple plates, respectively, as a substantially equal thickness water film, the latter being collected in water collector channels arranged at the lower ends of the ripple plates and being fed to a cooling water circuit, the improvement comprising

at least one plurality of said substantially vertically oriented, corrugated ripple plates parallel to each other and each having substantially horizontally running corrugations comprising crests and troughs parallel to each other and substantially aligned in phase with said crests and troughs, respectively, of adjacent of said ripple plates, each of said ripple plates defining a lowermost portion having a lowermost edge,

a water distribution device mounted above said plurality of ripple plates and for operatively spraying the water onto said ripple plates,

means for collecting and permitting a continuous flow therein of the water which has run down said ripple plates at a level no lower than said lowermost edge comprising only one substantially horizontally extending said water collector channel integrally connected completely along each side of each of said ripple plates on said lowermost portion of each of said ripple plates, at least said water collector channel on one of the sides of each of said ripple plates constitutes said lowermost edge thereon,

means for simultaneously removing the water in said water collector channels from at least one common side end of said ripple plates, said removing means constituting a support member supporting said one common side end of said ripple plates and defining a water removal channel therein extending substantially perpendicularly to said ripple plates and to said collector channels, respectively, disposed slightly lower than the level of said water collector channels and communicatingly connected therewith, and adapted to be fed therefrom to the cooling water circuit to said distribution device above said ripple plates.

two substantially horizontal transverse carrier members transversely oriented relative to said ripple plates, said two transverse carrier members exclusively support said ripple assembly element at said two common-side ends of said ripple assembly element, respectively,

one of said transverse carrier members constitutes said first-

mentioned support member and is formed with said water removal channel therein directly adjacent one of said common-side ends, the latter constituting said one common side end and constituting a common end of said water collector channels communicating with said water removal channel,

said ripple assembly element is inclined toward said water removal channel, and said one transverse carrier member has an inclined support surface adjacent said water removal channel, respectively, said one common side end of said ripple plates is supported on said inclined support surface, respectively, and substantially overlaps the latter substantially dipping into said water removal channel.

4,218,409

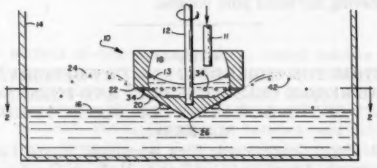
ENCAPSULATING METHOD

Clarence C. Dannelly, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 766,294, Jul. 7, 1977, Pat. No. 4,123,206. This application Aug. 16, 1978, Ser. No. 934,118

Int. Cl.[2] A61J 5/04

U.S. Cl. 264—4 **7 Claims**



1. A method of forming liquid filled capsules comprising

(a) flowing a droplet-forming fluid material, around which capsules are to be formed, into a nozzle supported for rotation about a vertical axis, said nozzle having a wall with an outside surface inclined upwardly with an increasing radius, and at least one orifice extending radially through said wall,

(b) placing said nozzle below the surface of a body of hardenable liquid having a viscosity of about 0.5–1500 centipoises wherein a portion of said inclined surface of said nozzle is submerged in said liquid with said orifice above the liquid surface level when said liquid is at rest,

(c) rotating said nozzle to extrude said material as droplets through the orifice by centrifugal force and to cause a sheet of said liquid to be impelled across at least a portion of the inclined surface of said nozzle and across said orifice at which a portion of said sheet separates and forms a film surrounding each of said formed droplets,

(d) causing said liquid film surrounding said droplets leaving said orifice to harden to contact with air or said liquid to form liquid-filled capsules, and

(e) collecting filled capsules in said body of liquid.

4,218,410

METHOD FOR THE PRODUCTION OF HIGH-PURITY METAL POWDER BY MEANS OF ELECTRON BEAM HEATING

Herbert Stephan, Bruchköbel; Hans Aichert, Hanau am Main, and Joseph Heimerl, Altenhässlau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 697,283, Jun. 17, 1976, abandoned. This application May 3, 1978, Ser. No. 902,475

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528999

Int. Cl.[2] B22D 23/08

U.S. Cl. 264—8 **6 Claims**

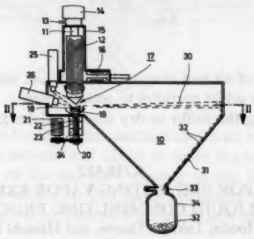
1. A method for making high-purity metal powder from high purity metal while maintaining the initial high purity of the starting material, comprising:

a. electron beam melting of high purity metal starting material in rod form in vacuo into molten metal droplets;

b. directing the molten metal droplets onto a spinning circular plate having a given diameter and a circumferential marginal area and rotating at a high speed about a vertical axis of rotation corresponding to the center of the spinning plate;

c. directing an electron beam focusable to a given focal spot on the plate;

d. directing the molten metal droplets by centrifugal force from the spinning plate in a controlled manner within a fixed narrow angular portion of the circumference of the



spinning plate to define a fixed narrow angular range of flight paths of the molten metal droplets leaving the plate by

i. focusing the focal spot such that its diameter is many times smaller than the given diameter of the spinning plate and

ii. deflecting the beam between the rotational center of the spinning plate and the marginal area to effect the scanning of the plate in a zone that extends radially of the axis of rotation of the spinning plate to said marginal area;

e. cooling and solidifying the droplets into metal particles due to loss of heat due to radiation during flight; and

f. collecting the particles to form the metal powder.

4,218,411

METHOD AND APPARATUS FOR PRODUCING PARTICULATE SULFUR

Harold A. Price, 1604 N. Shaffer, Orange, Calif. 92667, and F. Everett Wingate, 4791 E. Date, Fresno, Calif. 93725

Continuation of Ser. No. 683,022, May 4, 1976, abandoned, and a continuation-in-part of Ser. No. 561,937, Mar. 25, 1975, abandoned. This application Mar. 26, 1979, Ser. No. 24,009

Int. Cl.[2] B01J 2/04

U.S. Cl. 264—8 **1 Claim**

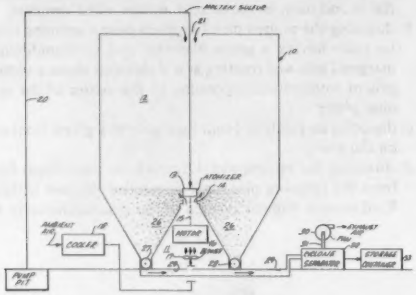
1. A method of producing particulate solid sulfur comprising the steps of:

atomizing molten sulfur by means of a rotating atomizer that ejects the molten sulfur as particles from its periphery;

forcing air to flow past the periphery of the rotating atomizer concurrently with the sulfur particles ejected by the atomizer to form a cooling zone that surrounds the atomizer;

spraying into the air before the air reaches the atomizer liquid water at a controlled rate that saturates or nearly saturates the air in the cooling zone without forming

water droplets in the cooling zone, the rate of sulfur ejection from the atomizer being low enough for the cooling



action of air and evaporation of liquid water to cause the molten sulfur particles to solidify; and

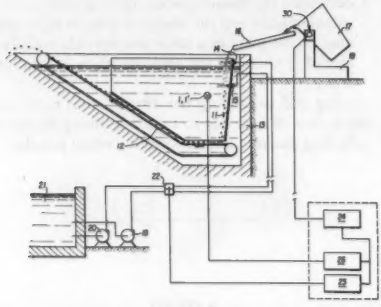
separating the sulfur as dry solid particles from the air.

4,218,412

METHOD FOR PREVENTING VAPOR EXPLOSION IN A LIQUID COMMINUTING PROCESS

Munetaka Honda; Takuya Tamou, and Hisashi Morimoto, all of Toyama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 705,179, Jul. 14, 1976, abandoned. This application Jan. 15, 1979, Ser. No. 3,421
Claims priority, application Japan, Jul. 16, 1975, 50-86155
Int. Cl.² B01J *2/06*
U.S. Cl. 264—11 **5 Claims**



1. In a method for prevention of vapor explosion resulting from vapor suddenly being generated under water in a process of liquid comminuting in metal refining by having one member selected from the group consisting of molten metal and molten slag introduced into water, the improvement therein comprising:

(a) placing a pressure detector under water for detecting peak pressure occuring during cooling of the molten material in the water,

(b) flowing the molten metal material into the water,

(c) detecting a pulse pressure signal generated during the liquid comminuting by vapors suddenly generated under water by flowing the molten material into the water,

(d) comparing the generated pulse pressure signal with a reference pressure, and

(e) adjusting the amount of molten material being introduced and the flow rate of water fed due to the result of comparing the generated pulse pressure signal with the reference pressure so as to lower said generated pulse pressure signal below said reference pressure whereby the prevention of vapor explosion is attained.

4,218,413

HIGH PORE VOLUME ALUMINA POWDERS

Donald E. Stowell, Oklahoma City, Okla.; John F. Scamehorn, Austin, Tex., and Larry L. Bendig, Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Dec. 18, 1978, Ser. No. 970,282
Int. Cl.² B01J *2/02*
U.S. Cl. 264—13 **1 Claim**

1. A method for forming alumina powder having particles of increased pore volume over prior methods, comprising:

(a) heating a water slurry of alumina to a temperature of no less than 190° F.,

(b) subjecting said slurry to a pressure of at least 50 psig, and exceeding the vapor pressure of said heated slurry,

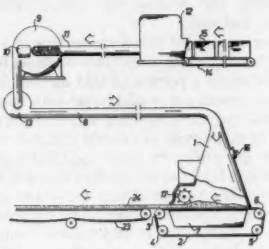
(c) passing said slurry through a relatively small orifice into a spray drying chamber wherein the vapor pressure of said slurry entering said drying chamber greatly exceeds the existing pressure within said drying chamber, and wherein droplets, formed by passing said slurry through said orifice, are dried in said chamber to form a powder having increased pore volume.

4,218,414

METHOD FOR SHREDDING AND DRY-DEFIBRATING COMPRESSED CELLULOSE PULP AND FORMING A BATT OF THE RESULTING CELLULOSIC FIBROUS MATERIAL

Per B. Hagg, Ornskoldsvik; Sven Bergstrom, Bjasta; Lars E. Lundmark, Jarved, and Carl-Erik L. Hedberg, Ornskoldsvik, all of Sweden, assignors to Mo och Domsjo AB, Ornskoldsvik, Sweden

Division of Ser. No. 765,508, Feb. 4, 1977, Pat. No. 4,167,378. This application Sep. 13, 1978, Ser. No. 942,018
Int. Cl.² D04H *1/20*
U.S. Cl. 264—40.4 **4 Claims**

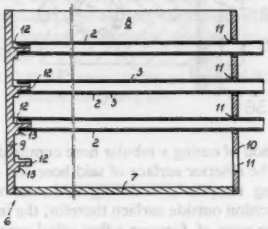


1. A process for preparing batts of relatively uniform density from shredded, defibrated cellulose pulp material, which comprises dry-shredding compressed cellulose pulp material to reduce the material to particulate form; dry-defibrating the shredded particles; feeding the shredded and defibrated cellulose pulp material to a batt-forming stage; and forming a batt from the resulting material on a foraminuous support; reducing the resulting batt to a uniform thickness and surface smoothness by removing fibers from the surface thereof; sensing the amount of fibrous material thus removed; increasing the rate of feed of shredded defibrated cellulose pulp material to the batt-forming stage whenever the sensed amount is below a predetermined limit, and decreasing the rate of feed of shredded defibrated cellulose material to the batt-forming stage whenever the sensed amount is above a predetermined limit, so as to obtain a batt of relatively uniform thickness, surface-smoothness and density from the shredded defibrated cellulose pulp material.

4,218,415
MANUFACTURE OF FOAM COATED ROD-LIKE ELEMENTS PARTICULARLY FOR SUPPORTING POT-GROWN PLANTS IN GENERAL

Elia Biscaro, Milan, Italy, assignor to Botanik S.r.l., Bresso, Italy

Continuation-in-part of Ser. No. 705,748, Jul. 15, 1976, abandoned. This application Jan. 10, 1978, Ser. No. 868,351
Claims priority, application Italy, Jul. 21, 1975, 25625 A/75
Int. Cl.[2] B29D *27/04*; A01G *17/04*
U.S. Cl. 264—46.4 3 Claims



1. A method of manufacture of foam coated rod-like elements for supporting pot-grown plants, comprisng the steps of:

horizontally placing into an empty mold cavity and at a distance from each other parallel elongated hollow tubular members leaving interspaces between said tubular members extending all along the tubular member, the tubular members having each at least one open ended extremity, and the mold cavity having walls confronting said open ended extremities

attaching at least one of the opposite ended extremities of each tubular member to the confronting wall of the mold cavity leaving a clearance between said confronting wall and the open ended extremity of said tubular members to thereby provide passage between said extremity and the confronting wall

introducing a foamable thermosetting resin reaction mixture into said mold cavity, and leaving the foam formed from said mixture to expand all around said tubular members and to pass through said clearances partially into the interior of said tubular members, thereby to obtain a foam block in which said tubular members are embedded and wherein the foam partially extends into the interior of the tubular members,

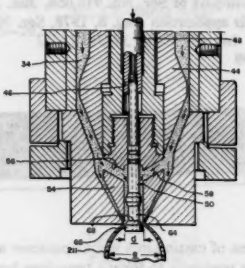
after hardening of the foam extracting the tubular members containing foam block from the mold cavity and cutting said foam block thus obtained into rectangular foam blanks each having a tubular member in its center and trimming the corners of said rectangular blanks so as to give the required shape to the obtained foam coated rod-like elements.

4,218,416
METHOD FOR EXTRUDING A PARISON

Cem M. Gokcen, Waukegan, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 13, 1978, Ser. No. 959,581
Int. Cl.[2] D01D *5/20*
U.S. Cl. 264—167 3 Claims

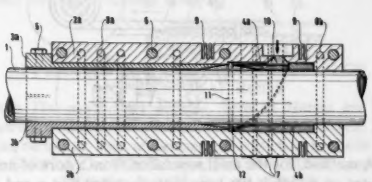
1. A method for extruding a parison for use in blowmolding a large container having a small entrance opening, said method comprising the steps of: extruding a tubular parison of molten thermoplastic material through a fixed outer dimension, variable inner dimension, closed loop extrusion orifice; decreasing the inner dimension of the orifice so as to increase the width of the orifice and adding material to the parison while extruding the same to vary the thickness of portions of the parison relative to the extent those portions of the parison will be expanded by blowmolding in a mold; and, as the inner dimension of the orifice is decreased, presenting means adjacent the orifice for mechanically directing the additional molten thermoplastic material added to the parison radially outwardly from the central axis of the parison to increase the inner and outer dimensions of the parison being extruded thereby (1) to decrease the ratio of the inner dimension of the mold to the outer dimension of the parison and (2) to increase the ratio of the inner dimension of the extruded parison to the fixed outer dimension of the orifice so that large containers with small entrance openings can be blowmolded from the extruded parison.



4,218,417
METHOD AND A DEVICE FOR REPAIRING INSULATED CABLE WHICH HAS BEEN DAMAGED OR JOINED

Patrick Jacquemart, Calais, France, assignor to Société Anonyme dite: les Cables de Lyon, Lyon, France

Filed Feb. 16, 1979, Ser. No. 12,694
Claims priority, application France, Mar. 14, 1978, 78 07275
Int. Cl.[2] B29D *23/02*; B29F *1/10*
U.S. Cl. 264—275 4 Claims



1. A method of covering, thickening or repairing an insulated, damaged electric cable or cable connection, by reconstituting the insulation or the sheath of the cable, said method comprising placing a moving mould around the cable with said moving mould comprising two main parts: a moving part and a stationary part both of which substantially surround a cable such that said moving part is slidably installed on the cable and defines a mould cavity which is open at one end facing towards the stationary part of the mould and closing the mould cavity by the moving part placed in a starting position for a moulding operation; and injecting molten thermoplastic material into the mould cavity at a pressure sufficient to move the moving part away from the stationary part over a period of time which is sufficient for the moving part to move over the distance required for the covering, thickening or repairing of the cable.

4,218,418
PROCESSES OF CASTING AN INGOT AND MAKING A SILICA CONTAINER

Frederick Schmid, Marblehead, and Chandra P. Khattak, Peabody, both of Mass., assignors to Crystal Systems, Inc., Salem, Mass.

Continuation-in-part of Ser. No. 918,056, Jun. 22, 1978, abandoned. This application Aug. 8, 1978, Ser. No. 931,418
Int. Cl.[2] C04B *33/34, 35/52*
U.S. Cl. 264—299 21 Claims

1. In the process of casting in a silica container an ingot of a material having a tendency to form a tenacious bond with the interior wall of the silica container, said process including the steps of first melting and thereafter solidifying said material to form said ingot, that improvement wherein said material is solidified in a silica container the wall of which comprises:

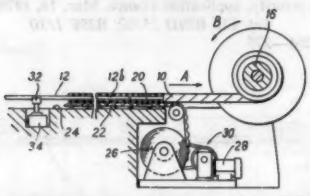
an interior surface defined by a thin glass skin; and,

without said skin, silica varying in cristobalite phase silica content, said content being greater in a region near said skin than in a region more distant from said skin, whereby contracting of said ingot of said material within and bonded to said skin of said Container will break said skin rather than cracking the ingot.

4,218,419
EXTRACTING CORE FROM HOSE

Deregibus Alfio, Padua, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 841,789, Oct. 13, 1977, Pat. No. 4,157,886. This application Feb. 21, 1979, Ser. No. 14,003
Int. Cl.[2] B29C *7/00*
U.S. Cl. 264—334 14 Claims



1. A method, for the axial separation from a core of uniform diameter on which it has been manufactured and cured, of an elastomeric hose of great length such as at least one hundred meters, which comprises the steps of:

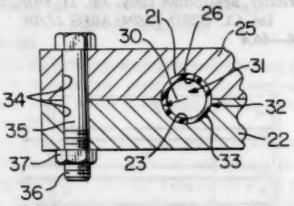
(i) placing the assembled core and hose on a substantially horizontal non-extensible bearer which is elongated and of at least substantially the same length as the hose, the bearer being such as to have a high coefficient of friction relative to the material of the hose, and

(ii) effecting relative movement of the core and the hose parallel to a common axis of the core and hose, to an extent sufficient to separate the core and hose totally in the axial direction, such relative movement being obtained by relative movement of said core and bearer with frictional force being applied between said bearer and the hose simultaneously at substantially every point along the length of that part of the hose which at any moment remains on the bearer.

4,218,420
HOSE CURING METHOD

Richard J. Jacob, and Reuben Wolk, both of Dayton, Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Apr. 18, 1979, Ser. No. 31,570
Int. Cl.[2] B29H *5/01;* B29C *25/00;* B29D *23/00;* B29H *7/14*
U.S. Cl. 264—570 10 Claims

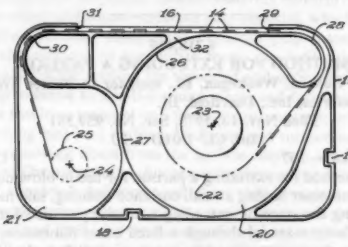


1. In a method of curing a tubular hose comprising the steps of confining the exterior surface of said hose and heating said hose to curing temperatures during said confining step to provide a precision outside surface therefor, the improvement comprising the steps of, forming a first spiral groove in a first mold structure to define a corresponding first wall of substantially semicircular cross-sectional configuration throughout its length, forming a second spiral groove in a second mold structure to define a corresponding second wall of substantially semicircular cross-sectional configuration throughout its length, said semicircular cross-sectional configurations of said first and second grooves having substantially the same radius, disposing a hose to be cured in said first spiral groove of said first mold structure, and detachably fastening said second mold structure against said first mold structure with said second groove in aligned relation with said first spiral groove to thereby define with said detachably fastened mold structures a confining wall consisting of said first and second walls and a tubular spiral groove of circular cross section having said hose disposed therewithin, said heating step comprising heating said mold structures with said hose confined by said confining wall in said tubular spiral groove to thereby provide optimum support for the exterior surface of said hose during curing which assures provision of said precision outside surface for said hose.

4,218,421
DISPOSABLE CONTAINER FOR A CONTINUOUS BAND OF TEST STRIPS

John C. Mack, Jr., and Dean M. Peterson, both of Littleton, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 18, 1978, Ser. No. 935,031
Int. Cl.[2] G01N *33/16, 31/00, 1/10*
U.S. Cl. 422—66 5 Claims



1. A self-contained, disposable cartridge unit for storing and dispensing a continuous band of chemical reagent test strips for use with the chemical analyzing apparatus, said cartridge unit comprising:

a first chamber for containing the unused portion of said band of test strips in substantially coil form;

a second chamber for containing the used portion of said band of test strips in substantially coil form;

barrier means in said cartridge unit internally isolating said second chamber from said first chamber;

oppositely facing spaced slotted openings in said first and said second chambers to permit the passage of said band of test strips from said first to said second chamber;

integral fixed platen for continuously supporting said band of said test strips between said first and second chambers wherein the addition of specimens to said test strips and the testing thereof may take place;

a single, drivable take-up reel associated with said second chamber having a sprocket adapted to be externally driven; and

alignment slots for positioning said disposable cartridge unit in said chemical analyzing unit.

4,218,422

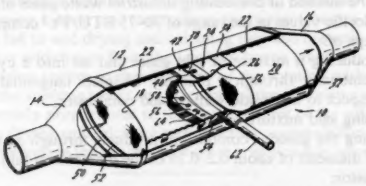
CONVERTER STRUCTURE

Donald N. Schock, Riverview, and Hans G. Schwallbach, St. Clair Shores, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 15, 1976, Ser. No. 732,687

Int. Cl.² B01J *8/02*; F01N *3/15*

U.S. Cl. 422—171 **2 Claims**



1. In a catalytic converter for combustion product comprising a shell defining first and second longitudinally spaced apart shell portions, said shell having an interior wall, a first substrate containing a reducing catalyst, the first substrate disposed in the first shell portion, a second substrate containing an oxidizing catalyst, the second substrate disposed in the second shell portion, said shell further having an inlet for introducing combustion product into the first shell portion and an outlet for exhausting combustion product from the second shell portion, and a third passageway providing communication between the first and second shell portions, means for introducing air into the combustion product flowing longitudinally through the third passageway and means for providing access to the air introducing means through the shell, the improvement wherein the air introducing means comprises at least one channel section, the at least one channel section being formed to extend perimetrally substantially completely about the interior wall of the shell generally transversely to combustion product flow through the third passageway, the at least one channel section including upstream and downstream edge portions for engaging the interior wall of the shell and an intermediate portion extending between the upstream and downstream edge portions for defining between the channel section and the shell interior wall a manifold, said manifold including a plurality of apertures opening inwardly for directing a plurality of streams containing air from the manifold into the combustion product.

4,218,423

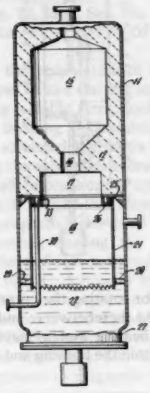
QUENCH RING AND DIP TUBE ASSEMBLY FOR A REACTOR VESSEL

Allen M. Robin, Anaheim, and Americo R. Catena, Rancho Palos Verdes, both of Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,224

Int. Cl.² B01J *7/00*

U.S. Cl. 422—207 **4 Claims**



1. Improved quench ring and dip tube assembly in combination with a reactor vessel having a refractory lined reactor chamber with a bottom outlet and a floor to support said lining, comprising

an annular conduit for carrying cooling water therein and adapted for mounting against said bottom outlet and said floor,

a dip tube for carrying hot gas and for directing molten slag from said outlet into a bath of quench water therebeneath, said dip tube extending into the quench water to form a liquid seal,

means for mounting said dip tube surrounding said annular conduit, and a plurality of individual passages angled downward and radially outward and skewed circumferentially to swirl said cooling water and for directing said cooling water against the inside of said dip tube to prevent said slag from sticking thereto.

4,218,424

APPARATUS FOR THE ZONE PULLING OF MONOCRYSTAL RODS

Joachim Floymayr; Karl Jericho, both of Hanau am Main; Dietrich Drechsel, Bruchköbel, and Friedrich Bubeck, Pforzheim, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Sep. 2, 1977, Ser. No. 830,379

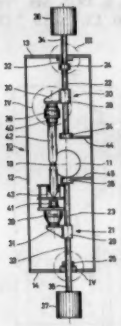
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640377

Int. Cl.² B01J *17/11*

U.S. Cl. 422—249 **6 Claims**

1. An apparatus for the zone drawing of a monocrystal rod, comprising: a hermetically sealed housing, two vertically aligned rod holders disposed one above the other in the housing; sliding guide means disposed within the housing for effecting the independent vertical movement of each rod holder and comprising two vertically movable transport slides, two rotatable spindle drives having their drive ends extending through opposite end walls of the housing and having the other ends cooperative with their associated transport slides to effect vertical movement of the transport slides along the sliding guide means when the spindle drives are rotated and at least two guiding columns for each transport slide defining a frame

for guiding the corresponding transport slide wherein the frames are disposed in an axially parallel manner in the housing; means mounting at least one of the frames for rotation about the axis of rotation of the corresponding drive spindles; drive motors disposed within the housing and mounted on



each transport slide for rotating the corresponding rod holder and thereby a rod held therebetween; and a vertically stationary high frequency heating system having the coil thereof disposed at a point within the housing and between the two rod holders.

4,218,425

PROCESS FOR EXTRACTING ARSENIC FROM OXIDIC MATERIALS

Thomas L. Charlton, Rossland, and Robert F. Redden, Fruitvale, both of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Jun. 29, 1978, Ser. No. 920,604
Int. Cl.[2] C01B *27/02*
U.S. Cl. 423—87 **5 Claims**

1. A process for extraction of arsenic from oxidic materials containing oxides of arsenic and antimony, said oxides being chosen from the group consisting of arsenic trioxide, arsenic pentoxide, antimony trioxide, antimony pentoxide, antimony tetroxide and mixed arsenic-antimony oxides which comprise the steps of subjecting said materials to a leach with a lixiviant of an aqueous solution containing arsenic acid in a concentration in the range of 25 to 200 g/l arsenic as arsenic pentoxide to substantially prevent dissolution of antimony, carrying out said leach at a temperature in the range of from 40° C. to the boiling point of the reaction mixture at atmospheric pressure for a time in the range of 5 to 90 minutes whereby a leach solution and a leach residue are formed, extracting at least a portion of the arsenic from said materials into said leach solution substantially retaining antimony in a leach residue, separating the leach solution from the leach residue, cooling separated leach solution to a temperature in the range of 5° to 25° C. whereby arsenic trioxide crystallizes with formation of mother liquor, recovering crystallized arsenic trioxide, treating mother liquor to regenerate lixiviant and returning regenerated lixiviant to the leach.

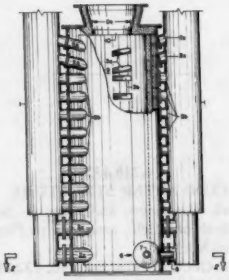
3. A process for extraction of arsenic from oxidic materials containing oxides of arsenic and antimony, said oxides being chosen from the group consisting of arsenic trioxide, arsenic pentoxide, antimony trioxide, antimony pentoxide, antimony tetroxide and mixed arsenic-antimony oxides which comprises the steps of subjecting said materials to a leach with a lixiviant of an aqueous solution containing hydrogen peroxide in a concentration in the range of 10 to 60% the amount of lixiviant being sufficient to selectively extract the extractable portion of arsenic from the oxidic materials as arsenic pentoxide and to oxidize the amount of arsenic trioxide formed by replacement of arsenic pentoxide by any antimony tetroxide present in the materials, carrying out said leach at a temperature in the range of from 40° C. to the boiling point of the reaction mixture at atmospheric pressure whereby a leach solution and a leach residue are formed, separating the leach solution from the leach residue and recovering arsenic pentoxide from the leach solution.

4,218,426

METHOD AND APPARATUS FOR THE COMBUSTION OF WASTE GASES

Karel R. Dahmen, Houston, Tex., assignor to Continental Carbon Company, Houston, Tex.

Continuation-in-part of Ser. No. 830,703, Sep. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 675,418, Apr. 9, 1976, abandoned. This application Jan. 19, 1979, Ser. No. 4,775
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 **1 Claim**



1. The method of combusting industrial waste gases of varying calorific values in the range of 30–75 BTU/Ft.[3] comprising the steps of:

introducing a mixture of said gases and air into a cyclone combustor through a plurality of inlets tangential with respect to the inside wall of said combustor;

causing said mixture to burn;

passing the gaseous combustion products through an outlet of diameter of about 0.2–0.75 of the diameter of said combustor;

varying the tangential inlet velocity, for a given mass flow rate, by changing the number of tangential inlets by opening or closing flow control means in at least one of said inlets, so as to reduce said velocity when burning waste gases of relatively higher calorific values of 46–75 BTU/Ft.[3] and to increase said velocity when burning waste gases of lower calorific values of 30–45 BTU/Ft.[3], so as to substantially balance the overall pressure losses across said inlets, combustor and outlet; and

utilizing a Swirl Number of about 1.0–1.5 when burning said higher calorific value gases and a Swirl Nunber of about 1.6–2.5 when burning said lower calorific value gases.

4,218,427

METHOD FOR NO_x REMOVAL FROM STACK GASES

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,207
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 **14 Claims**

2. A noncatalytic, dry-contact reduction method for removing nitrogen oxides from gaseous mixtures containing NO_x impurities which comprises:

(a) introducing an effective amount of coal having a volatile content of at least about 15 weight percent and the gaseous mixture into a fluidized bed reduction zone;

(b) maintaining the fluidized bed reduction zone at a temper-

ature within the range from about 400° to 700° C., thereby producing NO_x reducing agents comprising fluid phase coal devolatilization/gasification products, substantially reducing the nitrogen oxides in the gaseous mixture, and forming a treated gaseous mixture containing oxidizable products and a solids phase comprising coal char and ash;

(c) separating the solids phase from the treated gaseous mixture containing oxidizable products;

(d) adding sufficient oxygen-containing gas to the treated gaseous mixture in a second zone to convert substantially all of the oxidizable products to carbon dioxide and water without reformation of nitrogen oxides; and

(e) venting the resulting gas.

4,218,428

PROCESS FOR REMOVING CHLORINE IONS FROM THE WET FLUE-GAS PROCESSING SYSTEM

Yuichi Etoh; Akira Kitayama, both of Ichihara; Sadami Kobayashi, Sodegaura, and Shigeyoshi Okazaki, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 848,983, Nov. 7, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,405

Claims priority, application Japan, Nov. 15, 1976, 51-136374

Int. Cl.[2] C01B *17/06, 13/14*

U.S. Cl. 423—242 **2 Claims**

1. In a process for removing chlorine ions from a wet flue-gas processing system comprising the sequence of steps of bringing a flue-gas containing sulfur dioxide in contact with a circulating absorption solution containing a magnesium compound, separating solids from a part of the circulating absorption solution, drying and calcining the solids to regenerate and reuse the magnesium compound and washing the gas formed during the drying and calcining step with water in a washing tower, the improvement which comprises taking at least a part of the solution withdrawn from the washing tower out of the processing system and controlling the water content of the solids fed to said drying and calcining step and the ratio of the solution withdrawn from the washing tower taken out of the processing system so that the ratio of the solution withdrawn from the washing tower and taken out of the processing system is inversely proportional to the water content of the solids fed to the drying and calcining step whereby accumulation of the chlorine ions in the processing system is sufficiently prevented.

4,218,429

PRODUCTION OF ALKALI METAL DITHIONITES FROM SULFUR DIOXIDE, ALKALI METAL FORMATES, AND SLURRIED BISULFITE COMPOUNDS AT HIGH REACTANT CONCENTRATIONS

Logan C. Bostian, Virginia Beach, and Charles E. Winslow, Jr., Norfolk, both of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Continuation-in-part of Ser. No. 806,527, Jun. 14, 1977, abandoned. This application May 16, 1978, Ser. No. 906,583

Int. Cl.[2] C01B *17/66*

U.S. Cl. 423—515 **14 Claims**

1. In a process for the production of an anhydrous alkali metal dithionite by introducing as reagents aqueous sodium formate, a sulfur dioxide-methanol solution and a sodium compound into a reactor wherein,

(a) the methanol-to-water weight ratio is about 3.0 to about 5.2;

(b) the SO_2-to-water weight ratio is about 1.7 to about 2.4; and

(c) the ratio of equivalents of SO_2 to the equivalents of formate is about 1.3–1.7, the improvement which comprises using a sodium bisulfite compound, selected from the group consisting of $NaHSO_3$, $Na_2S_2O_5$, and mixtures thereof, as said sodium compound by suspending said compound in a portion of said methanol to form a slurry and introducing the slurry to the reactor in an amount such that it is added in excess of its solubility in the water, allowing reagents to react, and recovering said anhydrous alkali metal dithionite.

4,218,430

PROCESS FOR THE PRODUCTION OF POROUS METAL OXIDE MICROSPHERES AND MICROSPHERES PRODUCED BY SAID PROCESS

George E. Biggerstaff, Erwin, Tenn., assignor to Nuclear Fuel Services, Inc., Rockville, Md.

Filed Sep. 20, 1978, Ser. No. 944,027

Int. Cl.[2] C01G *49/08*

U.S. Cl. 423—632 **20 Claims**

17. A process for the preparation of low porous density, magnetite microspheres from a starting solution of a ferric salt comprising: preparing a stable ferric hydroxide sol from said ferric salt solution; forming microspheres from said ferric hydroxide sol by hot solvent dehydration technique with internal gellation; soaking the solvent dehydrated microspheres for approximately one-half to one hour in concentrated ammonia solution; washing and drying the ammonia treated microspheres; vacuum impregnating the dried microspheres with a fugitive organic material; heating the impregnated microspheres in an atmosphere of carbon dioxide to a temperature in the range of 800°–1100° C. followed by heating in air and subjecting the resulting microspheres to a reducing atmosphere of carbon monoxide and carbon dioxide in approximately 1:4 to 1:8 CO/CO_2 ratio by volume at a maximum temperature no higher than about 600° C. to convert the iron oxides of the microspheres to magnetite form.

4,218,431

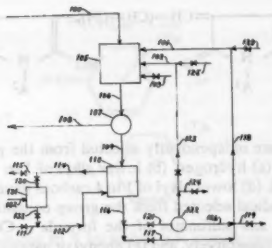
REMOVAL OF SULFIDE CONTAMINANTS FROM CARBONATE WATERS WITH PRODUCTION OF CO_2-FREE H_2S

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, New Rochelle, N.Y.

Continuation of Ser. No. 712,172, Aug. 6, 1976, abandoned. This application May 11, 1978, Ser. No. 904,979

Int. Cl.[2] B01D *5/00;* **G01B** *17/16*

U.S. Cl. 423—563 **45 Claims**



1. A process for separating the sulfide values from an aqueous liquid phase containing minor amounts of dissolved carbonates and dissolved sulfides and producing hydrogen sulfide essentially free of carbon dioxide, which process comprises:

(a) dispersing reactant in said aqueous liquid phase, said reactant consisting essentially of a quantity of water soluble metal salt the metal of which is selected from the class of metals having an electrode oxidation potential positive with respect to hydrogen in the electromotive series and having the capability of undergoing reaction with dissolved sulfides at a pH not less than 3 to form a solid phase metal sulfide reaction product which is essentially free of carbonates, said metal sulfide having a solubility product at 25° C. smaller than 10×10^{-15}, said quantity of said metal salt so dispersed essentially not exceeding the molar equivalent quantity of dissolved sulfides in said aqueous liquid phase,

(b) maintaining the pH of said aqueous liquid phase in step (a) at not less than 3 by addition of a basic substance thereto and effecting said reaction with said dissolved sulfides to form said solid sulfide reaction product and the aqueous liquid phase for step (c)

(c) separating from said solid metal sulfide reaction product and delivering, as first product of the process, said aqueous liquid phase comprising a carbonate solution but depleted in dissolved sulfides and essentially free of said metal salt,

(d) decomposing said solid metal sulfide reaction product by reacting the same with an aqueous acid comprising the negative radical of said metal salt, thereby forming hydrogen sulfide essentially free of carbon dioxide and reforming said metal salt,

(e) removing metal salt reformed in step (d) and delivering the same to step (a) as said reactant, and

(f) removing, as second product of the process, hydrogen sulfide essentially free of carbon dioxide formed in step (d).

4,218,432

COLORING AGENT AND A COMPOSITION INCLUDING THE SAME FOR COLORING TOILET BOWL FLUSHING WATER

Koichi Watanabe, Hirakata; Hiroaki Harada, and Akira Kotone, both of Nara, all of Japan, assignors to Yamamoto Kagaku Gosei Co., Ltd., Osaka, Japan

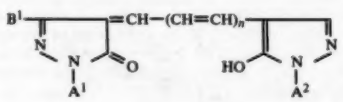
Filed Jun. 27, 1978, Ser. No. 919,693

Claims priority, application Japan, Jun. 28, 1977, 52/77463; Jun. 28, 1977, 52/77464; May 22, 1978, 53/61296

Int. Cl.² A01N *17/00;* **C09B** *69/00*

U.S. Cl. 424—14 **19 Claims**

1. In a composition suitable for use in coloring toilet bowl flushing water which comprises a coloring agent in admixture with at least one member of the group consisting of a disinfectant, a perfume, a surfactant, a chelating agent, a pH adjusting agent, a filler and a binder the improvement according to which the coloring agent employed is at least one water soluble compound of the formula



wherein

A^1 and A^2 are independently selected from the group consisting of (a) hydrogen, (b) lower alkyl of 1 to 4 carbons, (c) phenyl, (d) lower alkyl of 1 to 4 carbons having a water soluble radical selected from the group consisting of carboxylates and sulfonates of the formula —COOM and —SO_3M, respectively, and (e) phenyl or napthyl having at least one of the said water soluble radicals, wherein M is selected from the group consisting of an alkali metal, an alkaline earth metal, ammonium and lower alkylammonium wherein the alkyl has 1 to 4 carbons;

B^1 and B^2 are independently selected from the group consisting of (a) lower alkyl of 1 to 4 carbons, (b) phenyl, (c) carboxyl, (d) lower alkoxycarbonyl wherein the alkoxy has 1 to 4 carbons, and (e) phenyl or naphthyl having at least one of the said water soluble radicals, (f) hydroxyl, (g) lower alkoxyl of 1 to 4 carbons, (h) lower alkyl of 1 to 4 carbons having a carboxyl substituent, (i) lower alkyl of 1 to 4 carbons having a lower alkoxycarbonyl substituent wherein the alkoxyl has 1 to 4 carbons, (j) carbamoyl and (k) N-substituted carbamoyl wherein the substituent is lower alkyl of 1 to 4 carbons, phenyl or phenyl having a water soluble radical as defined above, and

the numeral n is 0, 1 or 2.

4,218,433

CONSTANT-RATE ELUTING TABLET AND METHOD OF PRODUCING SAME

Yoshida Kooichi, Soka; Shozi Eitoshi; Ootaki Hiroshi, both of Tokyo, and Terada Takashi, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,755

Claims priority, application Japan, Mar. 3, 1977, 52-23212

Int. Cl.² A61K *9/44, 9/28, 9/22, 9/20*

U.S. Cl. 424—15 **6 Claims**

1. A method of producing a constant-rate eluting tablet comprising the steps of molding a medicinal composition containing a water-soluble substance or substances with a pestle having a convexity or convexities to form a tablet having a hollow or hollows, and then coating this tablet with a coating agent which is insoluble in water but has water permeability, said hollow measuring 0.1 to 1.0 mm in width, 0.1 to 0.4 mm in depth and greater than 0.1 mm in length, and as for the area less than 1/6 of the overall surface area of the tablet, wherein the coating agent insoluble in water but having water permeability is a methacrylic acid—methacrylic acid ester copolymer, ethyl cellulose, cellulose acetate, polyvinyl acetate, cellulose acetate phthalate or hydroxypropyl cellulose phthalate, and wherein the coating thickness is within the range of 30 to 150μ.

4,218,434

METHOD OF CLEANING TEETH AND COMPOSITIONS FOR USE IN SUCH METHOD

Gunnar Rölla, Oslo, Norway, and Michael R. C. Winter, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 19, 1978, Ser. No. 916,937

Claims priority, application United Kingdom, Jun. 23, 1977, 26308/77

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **2 Claims**

1. In a method of cleaning dental plaque or stains, including tobacco stains, from human teeth by applying thereto in a plaque index regime of applications, from once a week, to 10 times per day, an aqueous composition which is in a form for use in a non-sequential manner and consists essentially of an effective amount of an unbound cation, in the form of a dissolved water soluble salt, said composition and said regime being substantially free from any ingredients which precipitate the cation as a water-insoluble salt, continuing the application until plaque or stains including tobacco stains, are removed and then orally discharging the composition, the improvement wherein said plaque or stains including smoking tobacco stains on said human teeth are removed, and no firmly attached plaque remains, by cleaning, brushing or rinsing said human teeth with a user concentration from about 0.01 m. moles to about 1 m. moles of said cation in the form of lanthanum chloride acetate or sulfate, yttrium chloride, ytterbium chloride, or gadolinium chloride, while said user avoids insoluble salt precipitation of said cation during said regime.

4,218,435
COMPOSITION FOR PERMANENT WAVING

Kikuo Shiba, Tokyo, Japan, assignor to Yamanouchi Pharmaceutical Co., Inc., Tokyo, Japan

Continuation of Ser. No. 822,717, Aug. 8, 1977, Pat. No. 4,153,681. This application Dec. 20, 1978, Ser. No. 971,415
Claims priority, application Japan, Aug. 19, 1976, 51-98897
The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.
Int. Cl.[2] A61K 7/09
U.S. Cl. 424—72 9 Claims

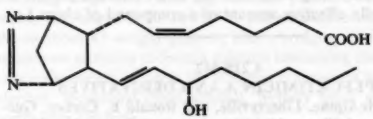
1. A composition for permanent waving of hair consisting essentially of an aqueous solution of a lower alkyl ester of cysteine or a mineral acid salt thereof and having a pH of 6.0–10.0, wherein the proportion of the lower alkyl ester of cysteine or the mineral acid salt thereof in the aqueous solution is 3–10% by weight.

4,218,436
COMPOUNDS AND METHODS

Francis A. Fitzpatrick, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 835,352, Sep. 21, 1977. This application Apr. 26, 1979, Ser. No. 33,484
Int. Cl.[2] A61K 37/02, 39/00
U.S. Cl. 424—85 32 Claims

1. An antibody extracted from a mammal or bird after innoculation with a conjugate formed from a carrier molecule selected from the group natural protein, synthetic polypeptide, and other macromolecular immunogen of molecular weight greater than 2,000 and less than 500,000 and a compound selected from the group



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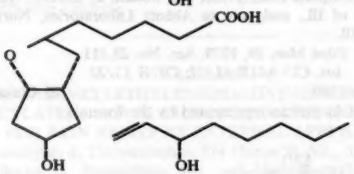
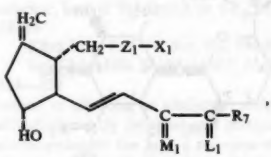


III

and



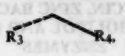
IV

wherein M_1 is

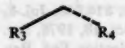
or

wherein R_5 is hydrogen or methyl;
wherein L_1 is

-continued

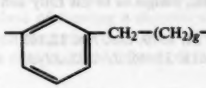


or a mixture of

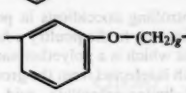


and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,

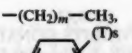


(9)

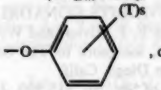


(10)

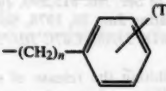
wherein g is one, 2, or 3;
wherein R_7 is



(1)

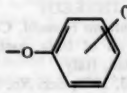


(2)



(3)

wherein m is one to 5, inclusive; n is zero or one; T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive; and s is zero, one, 2 or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and wherein X_1 is —$COOR_1$ wherein R_1 is hydrogen or a pharmacologically acceptable cation.

4,218,437
ANIMAL FEEDS CONTAININC A MIXTURE OF VIRGINIAMYCIN, ZINC BACITRACIN OR FLAVOPHOSPHOLIPOL AND PROTEOLYTIC ENZYMES

Guenter Hiller, Erkrath, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 814,047, Jul. 8, 1977, abandoned, and Ser. No. 814,048, Jul. 8, 1977, abandoned. This application Oct. 18, 1978, Ser. No. 952,410

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633105; Jul. 23, 1976, 2633106; Nov. 30, 1977, 2753309

Int. Cl.[2] A23K *1/165, 1/17*

U.S. Cl. 424—94 **31 Claims**

14. A method for efficient rearing of animals comprising feeding animals a high efficiency animal feed comprising carbohydrates, protein and fats and containing from 5 to 150 ppm of an antibiotic selected from the group consisting of Virginiamycin, zinc Bacitracin and flavophospholipol and a content of acid proteolytic enzymes with a wide spectrum of action in the range of between a pH of 2.5 and 6.5 in such an amount that the enzymatic activity is from 0.05 to 2.5 mTU/gm of said animal feed.

4,218,438
ANTICOCCIDIAL COMBINATIONS COMPRISING NICARBAZIN AND THE POLYETHER ANTIBIOTICS

Maurice E. Callender, Indianapolis, and Thomas K. Jeffers, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 14, 1979, Ser. No. 12,165

Int. Cl.[2] A61K *35/66, 31/505, 31/35*

U.S. Cl. 424—115 **33 Claims**

1. A process for controlling coccidiosis in poultry which comprises orally administering to the poultry a feedstuff comprising a first component which is a polyether antibiotic and a second component which is selected from the group consisting of nicarbazin and 4,4'-dinitrocarbanilide, said components being present in the feedstuff in amounts which, in combination, are synergistic as to at least one coccidiosis-causing strain of Eimeria.

4,218,439
PEPTIDE WHICH INHIBITS GONADAL FUNCTION

Catherine L. Rivier; Jean E. F. Rivier, and Wylie W. Vale, Jr., all of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 815,590, Jul. 14, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 917,781

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **5 Claims**

1. A method for inhibiting the release of steroids by the gonads of male mammals comprising administering to a male mammal an effective amount of a peptide having the formula

p—Glu—His—Trp—Ser—Tyr—D—Tr-
p—Leu—Arg—Pro—NH—CH_2—CH_3

4,218,440
ANTITUMORDEOXY-ANTHRACYCLINES AND USE THEREOF

Sergio Penco, Milan; Giuliano Franchi, Corsico, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

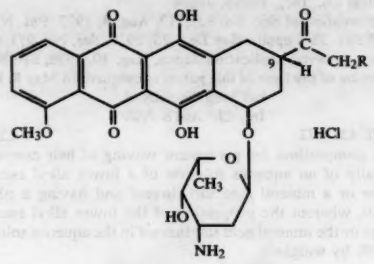
Filed Sep. 13, 1978, Ser. No. 941,920

Claims priority, application Italy, Sep. 5, 1978, 23152 A/78

Int. Cl.[2] A61K *31/71;* **C07H** *15/24*

U.S. Cl. 424—180 **2 Claims**

1. A method of treating a host afflicted with transplanted lymphocytic leukemia P_{388} comprising administering to a host afflicted therewith, a therapeutically effective amount of a compound of the formula:



wherein R is H or OH.

4,218,441
O-DEMETHYLSELDOMYCIN FACTOR 5

Ronald E. Carney, Gurnee; Robert L. DeVault; James B. McAlpine, both of Libertyville, and Arthur C. Sinclair, Lake Forest, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,240

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **3 Claims**

1. 0-Demethylseldomycin factor 5 or a pharmaceutically acceptable salt thereof.

3. A method of treating infection caused by a susceptible organism comprising administering to an infected patient an antibacterially effective amount of a compound of claim 1.

4,218,442
1-EPI-FORTIMICIN A AND DERIVATIVES

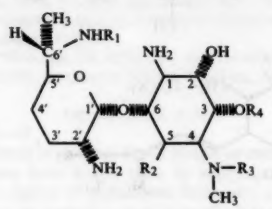
James B. McAlpine, Libertyville, and Ronald E. Carney, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,211

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **35 Claims**

1. A 1-Epi fortimicin represented by the formula



wherein: R_1 is hydrogen or loweralkyl; R_2 is hydrogen or hydroxyl, R_3 is selected from the group consisting of hydrogen, loweralkyl, aminoloweralkyl, diaminoloweralkyl, N-loweralkylminoloweralkyl, N,N-diloweralkylaminoloweralkyl, hydroxyloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl, acyl, aminoacyl, diaminoacyl, hydroxyacyl, hydroxy-substituted aminoacyl, hydroxy-substituted diaminoacyl, N-loweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted N-loweralkylaminoacyl and hydroxy-substituted N,N-diloweralkylaminoacyl; R_4 is hydrogen or methyl; and the pharmaceutically acceptable salts thereof.

22. A pharmaceutical composition comprising an antibac-

terially effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,218,443

POLYETHER IONOPHORES AS ANTIOBESITY AND HYPOTRIGLYCERIDEMIC AGENTS

Karen Comai, Nutley; Ann Sullivan, and John Westley, both of Cedar Grove, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 15, 1979, Ser. No. 3,158
Int. Cl.[2] A61K *31/35, 31/40, 31/60, 31/71*
U.S. Cl. 424—181 **12 Claims**

1. A method of treating obesity in warm blooded animals in need of such treatment which comprises orally administering to such warm blooded animals from 1 mg/kg/day to 300 mg/kg/day of a polyether compound with ionophore activity sufficient to inhibit fatty acid synthesis, the activity of pancreatic lipase or the activity of lipoprotein lipase.

4,218,444

INSECTICIDAL FORMULATION

Theodore H. Koundakjian, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 5, 1978, Ser. No. 912,777
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—212 **9 Claims**

1. An insecticidal formulation comprising 0.01 to 10 weight percent of acephate or acephatemet component, 0.01 to 30 weight percent of, a paraffinic hydrocarbon component having a boiling range at 10 mm Hg absolute pressure substantially within the range of 550° to 950° F. and an unsulfonated residue above about 85 weight percent; and a bridging component in an amount effective to form a solution containing the aforesaid two components, wherein the bridging component is isopropyl alcohol, secondary butyl alcohol, tertiary butyl alcohol, or methylene chloride.

4,218,445

N,N'DIBENZYLETHYLENEDIAMINE-DIACETYLSALICYLATE, A NOVEL CHEMOTHERAPEUTIC AGENT FOR PAIN RELIEF BY EXTERNAL APPLICATION

Mandayam J. Thirumalachar, 514 Huron St. SE., Apt. 1; Mandayam J. Narasimhan, Jr., and Mandayam J. Kasthuri-Thirumalachar, both of 514 Huron St. SE., all of Minneapolis, Minn. 55414

Filed May 8, 1978, Ser. No. 904,008
Int. Cl.[2] A61K *31/60, 31/61, 31/625*
U.S. Cl. 424—230 **12 Claims**

1. A method of effecting an analgesic, antipyretic, spasmolytic or antiinflammatory response in a mammalian host comprising administering to the host a response-effective amount of N,N'-dibenzylethylenediamine-diacetylsalicylate.

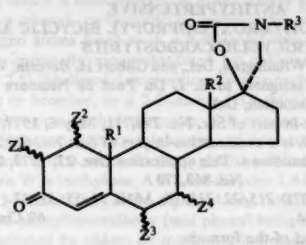
4,218,446

SUBSTITUTED STEROID-SPIRO-OXAZOLIDINONE DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

Sándor Sólyom; Lajos Toldy; Katalin Szilágyi née Faragó; Inge Schäfer; Eleonóra Szondy; János Borvendég, and Ilona Hermann née Szente, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyár Rt, Budapest, Hungary

Filed Mar. 29, 1979, Ser. No. 25,080
Claims priority, application Hungary, Jan. 4, 1978, GO 1397
Int. Cl.[2] A61K *31/58*
U.S. Cl. 424—241 **6 Claims**

3. A steroid-spiro-oxazolidinone compound of the formula (I)a



wherein

R^1 is hydrogen or methyl,

R^2 is C_{1-4} alkyl,

R^3 is hydrogen, C_{1-4} alkyl or C_{2-4} alkenyl,

Z^1 and Z^2 each are hydrogen or together form a second valence bond, or Z^1 is hydrogen and Z^2 is R^4—S—,

Z^3 and Z^4 each are hydrogen or together form a second valence bond, or Z^3 is hydrogen and Z^4 is R^4—S—, with at least one of the pairs Z^1–Z^2 and Z^3–Z^4 representing hydrogen and R^4—S—, and

R^4 is hydrogen or alkyl, alkenyl, or alkanoyl of up to 7 carbon atoms, provided that when Z^1 and Z^2 together form a valence bond, or Z^1 is hydrogen and Z^2 is R^4—S—,; R^1 is methyl, or a stereoisomer thereof.

5. A method of treating a diuretic condition in an animal subject which comprises the step of administering an effective amount of a compound as defined in claim 3 or a stereoisomer thereof.

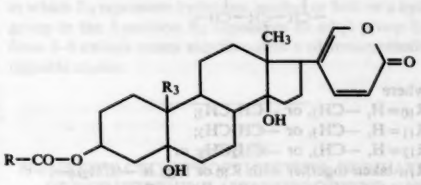
4,218,447

ACYL DERIVATIVES OF HELLEBRIGENIN

Otto Isaac, Hanau; Klaus Posselt, Bonn; Horst Uthemann, Frankfurt am Main, and Klaus Thiemer, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 858,406, Dec. 7, 1977. This application Apr. 9, 1979, Ser. No. 28,173
Claims priority, application United Kingdom, Dec. 17, 1976, 52759/76
Int. Cl.[2] A61K *31/58*
U.S. Cl. 424—241 **13 Claims**

1. A compound corresponding to the formula



(I)

in which R represent 2,2-dimethylethenyl; isopropyl; nonyl; a C_3–C_6-cycloalkyl radical; a phenyl group substituted by at least one nitro group, or a C_1–C_6-alkyl group containing a morpholine group attached thereto, said morpholine ring being substituted zero to twice by C_1–C_6-alkyl group; R_3 is —CHO or —CH_2OH or a salt of a compound of formula (I) having a basic nitrogen atom with a pharmaceutically acceptable acid.

9. A method of combatting the effect of heart insufficiency in a mammal comprising administering to the mammal an effective amount of a compound of claim 1 to increase the power of heart contraction.

4,218,448
ANTIHYPERTENSIVE POLYFLUOROHYDROXYISOPROPYL BICYCLIC AND TRICYCLIC CARBOSTYRILS

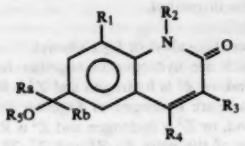
Paul E. Aldrich, Wilmington, Del., and Gilbert H. Berezin, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 793,711, May 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 699,587, Jun. 24, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,270

Int. Cl.[2] C07D *215/22, 215/18;* A61K *31/55, 31/47*

U.S. Cl. 424—244 69 Claims

1. A compound of the formula:



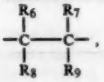
where

R_1=H or alkyl of 1-4 carbons:

R_2=H or alkyl of 1-4 carbons;

provided when R_1=alkyl, R_2=H, —CH_3 or —CH_2CH_3; or

R_1+R_2 taken together, is



(a)

where

R_6=H or —CH_3;

R_7=H or —CH_3;

R_8=H or alkyl of 1-4 carbons;

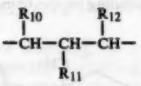
R_9=H or alkyl of 1-4 carbons; or

R_8+R_9, taken together, is —$(CH_2)_4$—;

provided

(i) at least one of R_6, R_7, R_8, or R_9=H; and

(ii) the sum of the carbons of R_6, R_7, R_8, and R_9 is not more than 6;



(b)

where

R_{10}=H, —CH_3, or —CH_2CH_3;

R_{11}=H, —CH_3, or —CH_2CH_3;

R_{12}=H, —CH_3, or —CH_2CH_3; or

R_{11}, taken together with R_{10} or R_{12}, is —$(CH_2)_4$—;

provided at least one of R_{10}, R_{11}, or R_{12}=H; or

(c) —$(CH_2)_4$—;

R_3=H, CH_3, F, Cl, Br, NO_2, NH_2, or OH;

R_4=H or alkyl of 1-4 carbons;

R_5=H, benzyl, alkanoyl, alkenoyl, and hydrocarbon aroyl or alkyl of 1-6 carbons;

Ra=CF_3, CF_2Cl or CF_2H;

Rb=CF_3, CF_2Cl or CF_2H;

and when R_5=H, its pharmaceutical suitable metal salt.

24. A pharmaceutical composition comprising a pharmaceutically suitable carrier and an effective antihypertensive amount of a compound of claim 1.

4,218,449
TREATMENT OF RHEUMATOID ARTHRITIS AND RELATED DISEASES

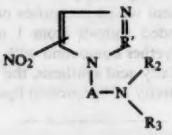
Roger Wyburn-Mason, Richmond, England, assignor to John R. A. Simoons, Summit, N.J.

Division of Ser. No. 935,401, Aug. 21, 1978. This application Mar. 8, 1979, Ser. No. 18,539

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—248.4 5 Claims

1. A method for producing remission in patients suffering from active rheumatoid arthritis which comprises orally administering to such a patient an effective amount of a compound of the formula:



wherein R′ is hydrogen or lower alkyl having from 1 to 7 carbon atoms, A is alkylene of from 1 to 6 carbon atoms, and R_2 and R_3 are ethyl or taken together with the N-atom is morpholino and the nitro group is in the 4 or 5 position.

4,218,450
METHOD FOR TREATMENT OF GASTROINTESTINAL SPASMODIC DISEASE CONDITIONS OR SYMPTOMS IN MAMMALS

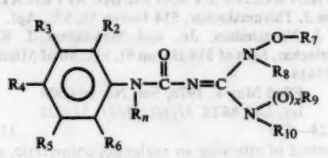
George H. Douglas, Malvern; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 934,780, Aug. 18, 1978, which is a division of Ser. No. 811,092, Jun. 17, 1977, Pat. No. 4,115,647, which is a division of Ser. No. 671,763, Mar. 30, 1976, Pat. No. 4,058,557. This application Jan. 8, 1979, Ser. No. 1,637

Int. Cl.[2] A61K *31/535, 31/42*

U.S. Cl. 424—248.54 9 Claims

1. The method for the treatment of gastrointestinal spasms in a mammal comprising administering thereto between 0.1 mg/kg. and 150 mg/kg. of an effective dose of a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:

hydrogen,

halo,

loweralkyl,

haloloeralkyl,

nitro,

amino,

acylamino,

hydroxy,

aralkyloxy or

loweralkoxy;

R_n is hydrogen or loweralkyl;

Rhd 7 and R_8 together and R_9 and R_{10} together with the N and O may form a ring selected from the group consisting of isooxazolidine and isooxazine;

x is 0-1; and

R_9 and R_{10}, when x is 0, may be the same or different and are:

hydrogen,
alkyl,
alkenyl,
alkynyl,
cycloalkyl or
aralkyl;
the sum total of carbon atoms present in R_7, R_8, R_9 and R_{10} together is less than twelve; and
the non-toxic acid addition salts thereof.

4,218,451
PENICILLINS AND THEIR USE

Peter Feyen, Mettmann; Hans-Bodo König, and Karl G. Metzger, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

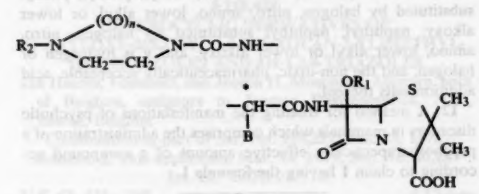
Filed Jun. 29, 1978, Ser. No. 920,505

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732104

Int. Cl.[2] A61K *31/43, 31/495;* **C07D** *499/68*

U.S. Cl. 424—250 **24 Claims**

1. A penicillin derivative of the formula



in which
R_1 is alkyl with 1 to 3 carbon atoms,
R_2 is hydrogen, alkyl with 1 to 4 carbon atoms, allyl, cyclopropyl, methylsulphonyl or phenylsulphonyl,
B is phenyl, 4-hydroxyphenyl, cyclohexadienyl, and n is 1 or 2, or a pharmaceutically acceptable salt thereof.

20. An antibacterial composition containing as an active ingredient an antibacterially effective amount of a compound or pharmaceutically acceptable salt thereof according to claim 1 in admixture with a pharmaceutically acceptable diluent.

4,218,452
SUBSTITUTED 4-PYRIMIDONE COMPOUNDS, COMPOSITIONS AND METHODS OF USE

Thomas H. Brown; Graham J. Durant, both of Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

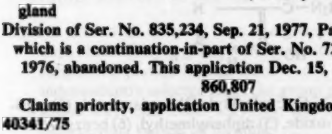
Division of Ser. No. 835,234, Sep. 21, 1977, Pat. No. 4,145,548, which is a continuation-in-part of Ser. No. 726,885, Sep. 27, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,807

Claims priority, application United Kingdom, Oct. 2, 1975, 40341/75

Int. Cl.[2] A61K *31/505;* **C07D** *403/12*

U.S. Cl. 424—251 **21 Claims**

1. A compound of the formula:



wherein Het' is a 2- or 4-imidazolyl ring optionally monosubstituted by lower alkyl, halogen, trifluoromethyl or hydroxymethyl, a 2-pyridyl ring optionally monosubstituted by lower alkyl, lower alkoxy, halogen, amino or hydroxy, a 2-pyridyl ring which is disubstituted by lower alkoxy groups, or which has a phenyl, carbocyclic or cyclic ether ring having two oxygen atoms fused to it, a 2-thiazolyl ring, a 3-isothiazolyl ring optionally monosubstituted by chlorine or bromine, a 3-(1,2,5)-thiadiazolyl ring optionally monosubstituted by chlorine or bromine, or a 2-(5-amino-1,3,4-thiadiazolyl)ring; Z is sulphur or a methylene group; X is oxygen or sulphur; W is methylene, oxygen or sulphur; m and n are such that their sum is from 1 to 4 when W is oxygen or sulphur, or from 0 to 4 when W is methylene; A is a 2,3-dihydro-1,4-benzodioxinyl or a 1,3-benzodioxolyl ring, a phenyl ring substituted with one or more phenylloweralkoxy (said phenyl being optionally monosubstituted by chloro or methoxy), loweralkoxyloweralkoxy, trifluoromethyl, di(loweralkyl)amino, phenoxy, halophenoxy, lower alkoxyphenoxy, phenyl, halophenyl or lower alkoxyphenyl groups and when W is not a methylene group, A may also be phenyl; and Y^3 is hydrogen or lower alkyl; or a pharmaceutically acceptable acid addition salt thereof.

13. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof an effective amount of a compound of claim 1.

4,218,453
N-SUBSTITUTED HEXAHYDRO-6-CANTHINONES FOR TREATING CARDIO-CIRCULATORY, CEREBROVASCULAR, AND RESPIRATORY DYSFUNCTION

Jean A. A. J. Hannart, 98, Avenue De Fré, Brussels, Belgium

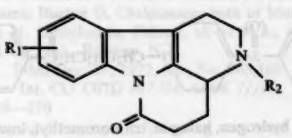
Filed Aug. 22, 1977, Ser. No. 826,857

Claims priority, application France, Aug. 26, 1976, 76 25802; May 31, 1977, 77 16546

Int. Cl.[2] A61K *31/445;* **C07D** *471/06*

U.S. Cl. 424—256 **5 Claims**

3. A pharmaceutical composition for use in human and veterinary medicine in treating cardio-circulatory, cerebrovascular and respiratory insufficiencies, containing an effective amount, from about 0.5 to 150 mg, of an active ingredient comprising at least one compound of the formula:



in which R_1 represents hydrogen, methyl or halo or a hydroxy group in the 8-position R_2 represents an alkyl group having from 1–4 carbon atoms together with a pharmaceutically acceptable carrier.

4,218,454
N-αMETHYLCYCLOPROPYLMETHYL DERIVATIVES OF NORMORPHINE AND NOROODEINE, AND ANALGESIC COMPOSITIONS AND METHODS EMPLOYING THE NORMORPHINE DERIVATIVES

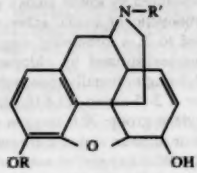
Joseph I. DeGraw, Sunnyvale; John A. Lawson, Monte Vista; Howard L. Johnson, Sunnyvale; Gilda H. Loew, Atherton, Calif., and Donald A. Berkowitz, El Cerrito, all of, assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 813,796, Jul. 8, 1977, abandoned. This application May 24, 1978, Ser. No. 909,257

Int. Cl.[2] A61K *31/485;* **C07D** *489/02*

U.S. Cl. 424—260 **5 Claims**

1. Compounds having the structure



wherein R represents hydrogen or methyl and wherein R' represents α-methylcyclopropylmethyl, together with their pharmaceutically acceptable acid addition salts.

4. A dosage unit for pharmaceutical composition for the amelioration of pain comprising an amount within a range of from about 2 to 1750 mg per dosage unit, therapeutically effective to ameliorate pain, N-α-methylcyclopropylmethylnormorphine, and its pharmaceutically acceptable acid addition salts, together with a pharmaceutically acceptable nontoxic carrier or diluent therefor.

5. A method having little addiction potential for ameliorating pain in a warm-blooded animal, said method comprising administering to said animal an amount, effective to ameliorate the pain, of N-α-methylcyclopropylmethylnormorphine together with the pharmaceutically acceptable acid addition salts thereof, said compounds having good antagonist characteristics.

4,218,455

1-(4-FLUOROPHENYL)-4-[1,2,3,6-TETRAHYDRO-4-(PHENYLTHIO)-1-PYRIDINYL]-BUTANONES AND RELATED SULFOXIDES AND SULFONES

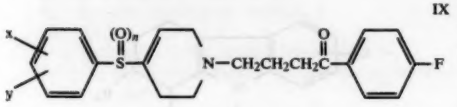
Lawrence D. Wise, Ann Arbor, Mich.; Patrick F. Flynn, Wilmington, Del., and Glenn C. Morrison, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 10, 1978, Ser. No. 922,511

Int. Cl.² A61K *31/44*; C07D *213/04*

U.S. Cl. 424—263 **13 Claims**

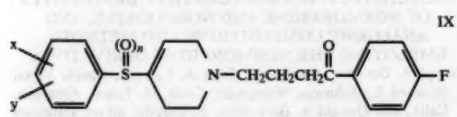
1. A compound having the formula IX:



IX

wherein x is hydrogen, halogen, trifluoromethyl, lower alkoxy, nitro, amino, lower alkyl of 1–6 carbons, phenyl, phenyl substituted with halogen, nitro, amino, lower alkyl or lower alkoxy; naphthyl or naphthyl substituted with halogen, nitro, amino lower alkyl or lower alkoxy; y is hydrogen or halogen; and n is 0, 1 or 2; and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

13. A method for treating psychotic conditions in mammals which comprises the administration of a sufficient amount of a compound having the formula IX:



IX

wherein x is hydrogen, halogen, trifluoromethyl, lower alkoxy, nitro, amino, lower alkyl of 1–6 carbons, phenyl, phenyl substituted with halogen, nitro, amino, lower alkyl or lower alkoxy; naphthyl or naphthyl substituted with halogen, nitro, amino, lower alkyl or lower alkoxy; y is hydrogen or halogen; and n is 0, 1 or 2; and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,218,456

1-(4-FLUOROPHENYL)-4-(1,2,3,6-TETRAHYDRO-4-PHENOXY-1-PYRIDINYL)-BUTANONES

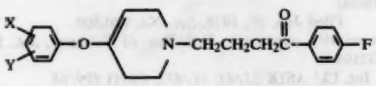
Lawrence D. Wise, Ann Arbor, Mich.; Patrick F. Flynn, Wilmington, Del., and Glenn C. Morrison, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 10, 1978, Ser. No. 922,512

Int. Cl.² A61K *31/44*; C07D *213/04*

U.S. Cl. 424—263 **12 Claims**

1. A compound having the formula I:



I

wherein x is hydrogen, halogen, trifluoromethyl, lower alkoxy, lower thioalkoxy, nitro, amino, lower alkyl, phenyl, phenyl substituted by halogen, nitro, amino, lower alkyl, or lower alkoxy; naphthyl, naphthyl substituted by halogen, nitro, amino, lower alkyl or lower alkoxy; and y is hydrogen or halogen, and the non-toxic, pharmaceutically acceptable, acid addition salts thereof.

12. A method for treating the manifestations of psychotic disorders in mammals which comprises the administration of a psychotherapeutically effective amount of a compound according to claim 1 having the formula I.

4,218,457

2-SUBSTITUTED 5-HYDROXY-1H-IMIDAZOLE-4-CARBOXAMIDE DERIVATIVES AND USE

Toshio Atsumi, Ashiya; Yuzo Tarumi, Nishinomiya, and Noboru Yoshida, Saitama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

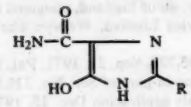
Filed Sep. 6, 1978, Ser. No. 940,131

Claims priority, application Japan, Sep. 6, 1977, 52-107641; Oct. 17, 1977, 52-124992; Oct. 17, 1977, 52-124995; Mar. 13, 1978, 53-28900

Int. Cl.² A61K *31/415, 31/44*; C07D *233/32, 403/04*

U.S. Cl. 424—263 **26 Claims**

1. A compound selected from the group consisting of an amide of the formula



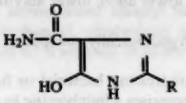
(I)

wherein R is (1) C_3–C_7 cycloalkyl, (2) 1-adamantyl, (3) pyridyl, (4) pyridine N-oxide, (5) diphenylmethyl, (6) benzyl which may or may not be substituted with nitro, halogen, C_1–C_3 alkyl or C_1–C_3 alkoxy, or (7) phenyl which may or may not be substituted with nitro, halogen, hydroxy, C_1–C_3 alkyl, C_1–C_3 alkoxy, carboxy, C_2–C_4 alkoxycarbonyl, phenoxycarbonyl, carbamoyl, N-phenylcarbamoyl, N-adamantylcarbamoyl, benzoylamino, trifluoromethyl, C_2–C_4 alkanoyloxy, 1-adamantoyloxy or benzoyloxy, and

a non-toxic pharmaceutically acceptable salt of said amide.

18. A pharmaceutical composition useful as an immunostimulant, or as an anticancer agent against Sarcoma 180, which comprises a pharmacologically effective amount of a compound of claim 1 as an active ingredient, and a pharmaceutically acceptable carrier therefor.

19. A compound of the formula



wherein R is C_3–C_{17} alkyl, or a non-toxic pharmaceutically acceptable salt thereof.

20. A pharmaceutical composition useful as an immunostimulant, or as an anticancer agent against Sarcoma 180, which comprises a pharmacologically effective amount of a compound of claim **19** as an active ingredient, and a pharmaceutically acceptable carrier therefor.

4,218,458

HETEROCYCLIC DERIVATIVES OF (4-ARYLOXY-METHYL-1,3-DIOXOLAN-2-YL)METHYL-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

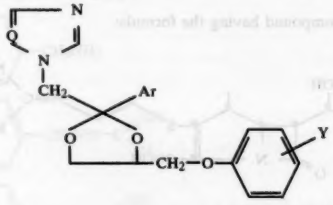
Jan Heeres, Vosselaar, and Joseph H. Mostmans, Antwerp, both of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 918,257, Jun. 23, 1978, abandoned. This application Mar. 14, 1979, Ser. No. 20,287

Int. Cl.[2] **C07D** *271/10*

U.S. Cl. 424—269 **6 Claims**

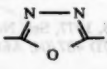
1. A chemical compound selected from the group consisting of an azole derivative having the formula:



and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

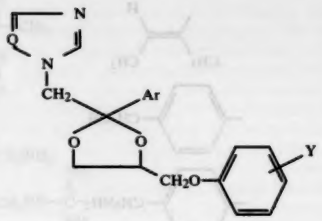
Q is a member selected from the group consisting of CH and N;

Ar is a member selected from the group consisting of thienyl, halothienyl, phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and the radical Y is a heterocyclic radical of formula:



wherein R^7 is selected from the group consisting of hydrogen and lower alkyl.

5. A composition for combatting a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antifungal or antibacterial amount of a compound selected from the group consisting of an azole derivative having the formula

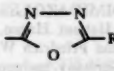


and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is a member selected from the group consisting of CH and N;

Ar is a member selected from the group consisting of thienyl, halothienyl, phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a heterocyclic radical of formula



(e)

wherein R^7 is selected from the group consisting of hydrogen and lower alkyl;

wherein said aryl as used in the foregoing definitions is selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl.

4,218,459

6-AMIDO-1-CARBA-2-PENEM-3-CARBOXYLIC ACID

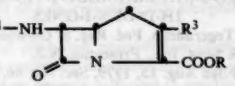
Lovji D. Cama; Burton G. Christensen, both of Metuchen, and Ravindra N. Guthikonda, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 28, 1977, Ser. No. 865,169

Int. Cl.[2] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 424—270 **15 Claims**

1. A compound having the following structural formula:



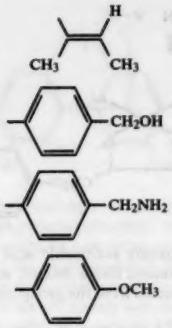
wherein

R is a pharmaceutically acceptable salt or benzyl, p-nitrobenzyl, o-nitrobenzyl, t-butyl, bromo-t-butyl, t-butyldimethylsilyl, trimethylsilyl, trichloroethyl;

R^1 is phenylacetyl, D-phenylglycyl, (α-carboxy)-2-thienylacetyl, (α-carboxy)phenylacetyl, α-hydroxyphenylacetyl, or 3-isothiazoylacetyl;

and R^3 is substituted and unsubstituted: loweralkyl having from 1 to 4 carbon atoms, lower alkenyl having 2–6 carbon atoms, or phenyl wherein the substituent is selected from the group consisting of hydroxyl, amino, amidino, guanidino, phenyl, aminoalkyl, hydroxyalkyl, mercapto, carboxyl, trifluoromethyl, loweralkylthio, and loweralkoxyl wherein the alkyl or alkoxyl has 1 to 6 carbon atoms.

2. The compound of claim **1** wherein R^3 is H, C_6H_5, CH_3,



15. A pharmaceutical antibiotic compositions comprising, in unitary dosage form, a therapeutically effective amount of a compound according to claim 2 and a pharmaceutical carrier therefor.

4,218,460

NITROIMIDAZOLES

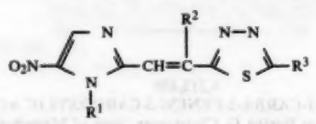
Helmut Fleig, Mannheim; Helmut Hagen, Frankenthal; Toni Dockner, Meckenheim, and Friedrich W. Kohlmann, Moorrege, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 875,904, Feb. 7, 1978, abandoned, which is a continuation of Ser. No. 727,798, Sep. 29, 1976, abandoned. This application Nov. 7, 1978, Ser. No. 958,399

Int. Cl.[2] C07D *417/06*

U.S. Cl. 424—270 **15 Claims**

1. Nitroimidazolylvinylthiadiazoles of the formula I



I,

where R^1 is alkyl of 1 to 4 carbon atoms which may be substituted by hydroxy or alkoxy of 1 to 4 carbon atoms in the alkyl, R^2 is hydrogen or methyl, and R^3 is hydrogen, methyl, ethyl phenyl or pyridyl.

4,218,461

2,3-DIHYDRO-2-[(1H-IMIDAZOL-1-YL)-METHYLENE]-1H-INDEN-1-ONES

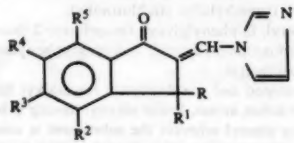
Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 15, 1979, Ser. No. 66,726

Int. Cl.[2] A61K *31/415;* C07D *233/56*

U.S. Cl. 424—273 R **14 Claims**

1. A compound of the formula



wherein

R, R_1, R^2, R^3, R^4 and R^5 may be the same or different and each is hydrogen, lower alkyl, halogen, lower alkoxy, lower alkylthio, phenyl-lower alkyl, phenyl or substituted phenyl, wherein the phenyl bears one halogen, hydroxy, lower alkoxy, lower alkyl, lower alkylthio, cyano or nitro group;

and non-toxic physiologically acceptable acid addition salts thereof.

14. A method for treating bacterial or fungal infections in mammals which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1.

4,218,462

6-(1-HYDROXYETHYL)-2-(2-AMINOETHYLTHIO)-1-SUBSTITUTED-1-CARBADE-THIAPEN-2-EM-3-CARBOXYLIC ACIDS

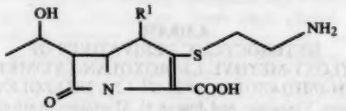
Burton G. Christensen, Metuchen, and David H. Shih, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 24, 1978, Ser. No. 954,270

Int. Cl.[2] C07D *487/04;* A61K *31/40*

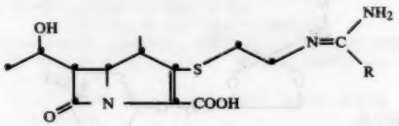
U.S. Cl. 424—274 **5 Claims**

1. A compound having the formula:



and its pharmaceutically acceptable salts wherein R^1 is selected from the group consisting of substituted and unsubstituted loweralkyl having from 1–6 carbon atoms, phenyl, phenylloweralkyl, cycloalkyl having from 3 to 6 carbon atoms, and cycloalkylalkyl having 4 to 7 carbon atoms in the chain and 3–6 carbon atoms in the ring; wherein said substituents on R^1 are selected from the group consisting of halogen, hydroxyl, amino, alkyl having 1–6 carbon atoms, azido, cyano, and carboxyl.

4. A compound having the formula:



wherein R is H or CH_3.

5. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1, 2, 3, or 4 and a pharmaceutically carrier therefor.

4,218,463

3-SUBSTITUTED THIO-6-AMIDO-7-OXO-1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID

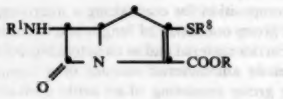
Burton G. Christensen, Metuchen; Ravindra N. Guthikonda, Edison; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 28, 1977, Ser. No. 865,165

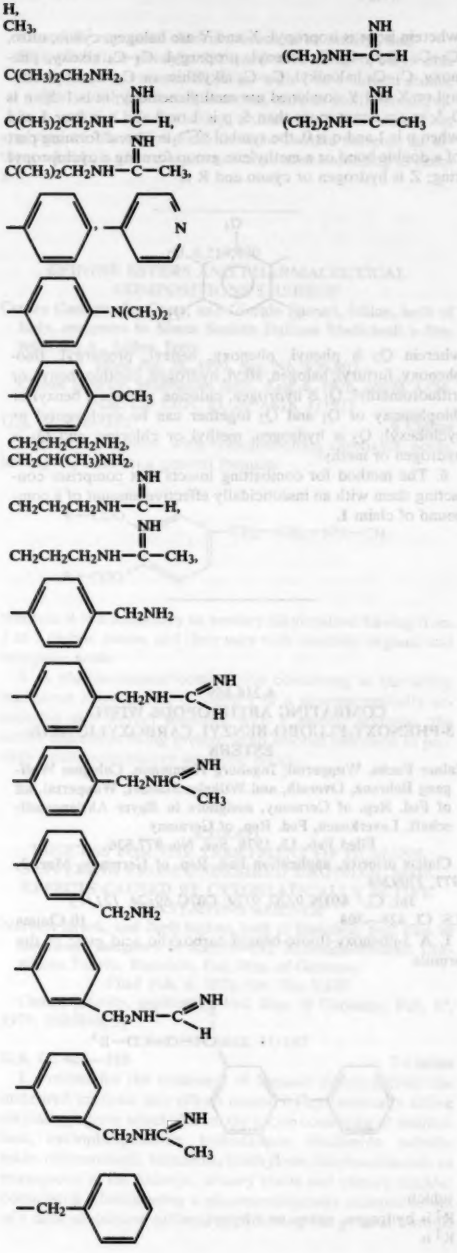
Int. Cl.[2] C07D *487/04;* A61K *31/40*

U.S. Cl. 424—274 **3 Claims**

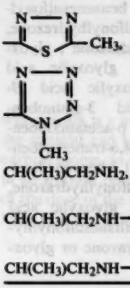
1. A compound having the structure:



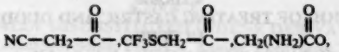
and the pharmaceutically acceptable salts thereof wherein R is H, a pharmaceutically acceptable salt cation or lower alkyl having 1–4 carbon atoms, lower alkenyl having 1–4 carbon atoms, benzyl, p-nitrobenzyl, pivaloyloxy methyl, 3-phthalidyl, or phenacyl; and R^8 is selected from the group consisting of



-continued



R^1 is hydrogen, thienylacetyl, phenylacetyl,



or o-nitrophenylacetyl.

3. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,218,464

4- AND 5-SUBSTITUTED 2,3-DIHYDRO-1H-ISOINDOLES, PHARMACEUTICAL COMPOSITIONS AND METHOD OF INHIBITING PHENYLETHANOLAMINE N-METHYLTRANSFERASE

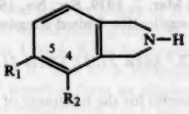
William E. Bondinell, Cherry Hill, N.J., and Robert G. Pendleton, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Mar. 2, 1979, Ser. No. 17,005

Int. Cl.[2] **A61K** *31/40;* **C07D** *209/44*

U.S. Cl. 424—274 **10 Claims**

1. A compound of the formula:



in which

R_1 and R_2 are chloro, bromo, fluoro, iodo or trifluoromethyl, R_1 and R_2 being the same or different and in the 4- and 5-position or a pharmaceutically acceptable acid addition salt thereof.

9. A method of inhibiting phenylethanolamine N-methyltransferase which comprises administering to an animal requiring said treatment an amount sufficient to produce said inhibition of a chemical compound as defined in claim 1.

4,218,465

GLYOXYLIC ACID HYDROCARBYLSULFONYLHYDRAZONES AND THERAPEUTIC COMPOSITIONS

Edward W. Grange, Palo Alto, Calif.; David W. Henry, Chapel Hill, N.C., and William W. Lee, Palo Alto, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Apr. 17, 1978, Ser. No. 887,474

Int. Cl.[2] **A61K** *31/38, 31/16, 31/15;* **C07O** *333/24*

U.S. Cl. 424—275 **2 Claims**

1. A process for treating leukemia which comprises administering to a warm-blooded animal having an abnormal proportion of leukocytes a therapeutic nontoxic amount of at least one

compound selected from the group consisting of glyoxylic acid p-toluenesulfonylhydrazone, glyoxylic acid benzenesulfonylhydrazone, glyoxylic acid p-clorobenzenesulfonylhydrazone, glyoxylic acid p-methoxybenzenesulfonylhydrazone , glyoxylic acid-m-nitrobenzenesulfonylhydrazone, glyoxylic acid 2,5-dichlorobenzenesulfonylhydrazone, glyoxylic acid β-naphthylsulfonylhydrazone, glyoxylic acid 3-aminobenzenesulfonylhydrazone · HCl, glyoxylic acid p-acetamidobenzenesulfonylhydrazone, glyoxylic acid 2,4,6-trimethylbenzenesulfonylhydrazone, digyloxylic acid 1,3-benzenedisulfonylhydrazone, glyoxylic acid 2-thienylsulfonylhydrazone, glyoxylic acid β-styrenesulfonylhydrazone, glyoxylic acid benzylsulfonylhydrazone, glyoxylic acid methanesulfonylhydrazone, glyoxylic acid 1-butanesulfonylhydrazone or glyoxylic acid n-hexadecanesulfonylhydrazone.

4,218,466

METHOD OF TREATING GASTRIC AND DUODENAL ULCERS

Salomon Z. Langer, and Allan G. Roach, both of Paris, France, assignors to Synthelabo, Paris, France

Continuation-in-part of Ser. No. 943,475, Sep. 18, 1978, abandoned. This application Apr. 13, 1979, Ser. No. 29,935

Int. Cl.² A61K *31/38*

U.S. Cl. 424—275 **2 Claims**

1. A method of lowering the gastric acidity in a patient having excess gastric acidity by orally administering to said patient an effective amount of 5-(2-dimethylamino-ethyl)-cis-2-(4-methoxy-phenyl)-4-oxo-2,3-dihydro-5H-1,5-benzothiazepin-3-yl said gastric acidity.

4,218,467

8-METHOXY-3-PHENYL-5-METHYL-PROPARGYLAMINO-METHYL-2H-1 BENZOPYRAN-2-ONE AND PHARMACEUTICAL COMPOSITIONS CONTAIN IT

Davide Milani, Milan, Italy, assignor to Dott. Formenti S.p.A., Milan, Italy

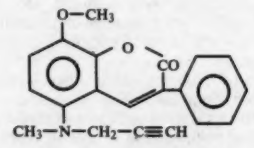
Filed Mar. 2, 1979, Ser. No. 16,908

Claims priority, application United Kingdom, Mar. 16, 1978, 10421/78

Int. Cl.² A61K *31/37;* **C07D** *311/12*

U.S. Cl. 424—281 **3 Claims**

1. A compound useful for the treatment of convulsive states, having the formula:



and the chemical name of which is 8-methoxy-3-phenyl-5-methylpropargylaminomethyl-2H-1-benzopyran-2-one.

4,218,468

KETONE INSECTICIDES

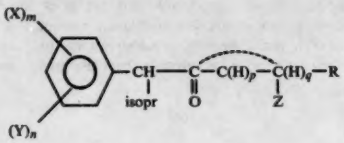
Jill H. Paul, Edgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 959,820

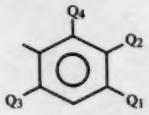
Int. Cl.² A01N *9/20, 9/24;* **C07C** *121/76, 49/84*

U.S. Cl. 424—282 **15 Claims**

1. Compounds having the formula:



wherein isopr is isopropyl; X and Y are halogen, cyano, nitro, C_1–C_4 alkyl, C_1–C_4 alkenyl, propargyl, C_1–C_4 alkoxy, phenoxy, C_1–C_4 haloalkyl, C_1–C_4 alkylthio, or C_1–C_4 alkylsulfonyl or X and Y combined are methylenedioxy; m is 1–5; n is 0–5; m+n is not more than 5; p is 1 or 2 and q is 0 or 1 and when p is 1 and q is 0, the symbol ⌒ is a bond forming part of a double bond or a methylene group forming a cyclopropyl ring; Z is hydrogen or cyano and R is



wherein Q_2 is phenyl, phenoxy, benzyl, propargyl, thiophenoxy, furfuryl, halogen, alkyl, hydrogen, oxothiophenyl, or trifluoromethyl; Q_1 is hydrogen, chlorine, phenoxy, benzyl or thiophenoxy or Q_1 and Q_2 together can be cyclopentyl or cyclohexyl; Q_3 is hydrogen, methyl or chlorine; and Q_4 is hydrogen or methyl.

6. The method for combatting insects that comprises contacting them with an insecticidally effective amount of a compound of claim 1.

4,218,469

COMBATING ARTHROPODS WITH 3-PHENOXY-FLUORO-BENZYL CARBOXYLIC ACID ESTERS

Rainer Fuchs, Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

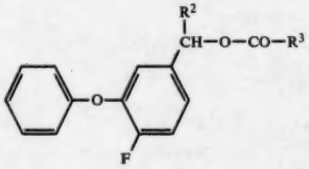
Filed Feb. 13, 1978, Ser. No. 877,536

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709264

Int. Cl.² A01N *9/20, 9/24;* **C07C** *69/74, 121/75*

U.S. Cl. 424—304 **10 Claims**

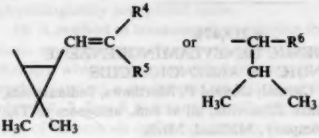
1. A 3-phenoxy-fluoro-benzyl carboxylic acid ester of the formula



in which

R^2 is hydrogen, cyano or ethynyl,

R^3 is



R^4 and R^5 represent chlorine, bromine or methyl, and

R^6 is phenyl or phenyl substituted with halogen, alkyl with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, nitro or methylenedioxy.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of an ester according to claim 1.

4,218,470
EPININE ESTERS AND PHARMACEUTICAL COMPOSITIONS THEREOF

Cesare Casagrande, Como, and Giorgio Ferrari, Milan, both of Italy, assignors to Simes Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

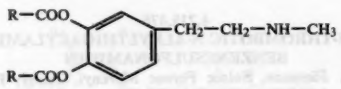
Filed Jul. 28, 1977, Ser. No. 820,007

Claims priority, application Italy, Aug. 5, 1976, 26074 A/76

Int. Cl.[2] C07C *93/26;* A61K *31/215*

U.S. Cl. 424—311 6 Claims

1. Esters of epinine with branched-chain carboxylic acids, having the following general formula:



wherein R is a secondary or tertiary alkyl radical having from 3 to 7 carbon atoms, and their salts with nontoxic organic and inorganic acids.

4. A pharmaceutical composition containing as the active ingredient a compound of claim 1 or a pharmaceutically acceptable salt thereof together with a galenic material, the active ingredient being present in an amount sufficient to provide a cardiocirculatory analeptic effect.

4,218,471
PROCESS FOR THE TREATMENT OF HUMANS SUFFERING FROM UNDESIRED UROTOXIC SIDE EFFECTS CAUSED BY CYTOSTATICALLY ACTIVE ALKYLATING AGENTS

Norbert Brock, and Jurij Stekar, both of Bielefeld, Fed. Rep. of Germany, assignors to Asta-Werke Aktiengesellschaft Chemische Fabrik, Bielefeld, Fed. Rep. of Germany

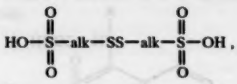
Filed Feb. 6, 1979, Ser. No. 9,625

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806866[U]

Int. Cl.[2] A61K *31/185*

U.S. Cl. 424—315 7 Claims

1. Process for the treatment of humans suffering from the undesired urotoxic side effects caused by cytostatically active alkylating agents selected from the group consisting of melphalane, cyclophosphamide, trofosfamide, ifosfamide, sufosfamide, chlorambucil, busulfane, triethylene thiophosphamide or triaziquone in the kidneys, urinary tracts and urinary bladder comprising administering a pharmacologically acceptable salt of a dithiodi-(alkane sulfonic acid) having the general formula



wherein alk is a member selected from the group consisting of the straight and branched alkylene groups having from 2 to 6 carbon atoms, to the human treated with the alkylating agent in an amount ranging from 20% to about 150% of the weight of the dose of the alkylating agent of the salt of the dithiodi-(alkane sulfonic acid).

4,218,472
GEMINALLY DISUBSTITUTED INDENE DERIVATIVES

Aake N. Jönsson, Solna; Tomas G. Kempe, Enebyberg; Lembit Mikiver, Jaerna, and Bengt Å. Sparf, Traangsund, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

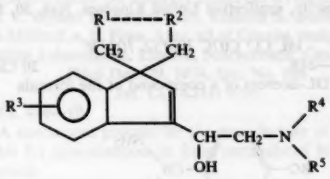
Filed Aug. 1, 1978, Ser. No. 930,073

Claims priority, application United Kingdom, Aug. 5, 1977, 32947/77

Int. Cl.[2] A01N *9/20, 9/22;* C07C *91/22*

U.S. Cl. 424—316 38 Claims

1. Geminally disubstituted indenes characterised in that they are of the formula (I)



(I)

wherein each of R^1 and R^2 is hydrogen or R^1 and R^2 together form a direct bond or an alkylene group $—(CH_2)_n—$, in which n is an integer from 1 to 4, R^3 is hydrogen, C_{1-3}-alkoxy or halogen, and each of R^4 and R^5 is hydrogen or C_{1-4}-lower alkyl, or R^4 and R^5 together form an alkylene group $—(CH_2)—$, in which m is an integer from 3 to 6; and salts with physiologically acceptable acids thereof.

27. A method of treatment involving a sympathomimetic effect which comprises administering to a host in need of such treatment an effective amount for such treatment of a compound, or salt thereof, or optically active isomer thereof according to claim 1 or 2 or 5.

4,218,473
DERIVATIVES OF 4-CYCLOHEXYL-1-NAPHTHALENE-ACETIC ACID AND THEIR USE AS DRUGS

Jean-Jacques Godfroid, and Efrëim Steiner, both of Paris, France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

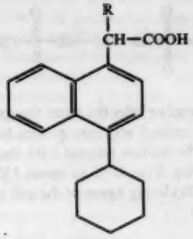
Filed Sep. 26, 1978, Ser. No. 945,891

Claims priority, application France, Oct. 3, 1977, 77 29728

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—317 6 Claims

1. Derivatives of naphthalene acetic acid of formula:



wherein R is a lower alkyl group and their pharmaceutically acceptable salts and methyl ester thereof.

3. Pharmaceutical anti-inflammatory composition comprising an anti-inflammatory effective amount of a compound according to claim 1 in a pharmaceutically acceptable carrier.

6. Method of treatment of patients having inflammatory syndromes which comprises the administration of an anti-inflammatory effective amount of a compound according to claim 1 in a pharmaceutical carrier.

4,218,474

DERIVATIVES OF L- AND DL-4-HYDROXYPHENYLGLYCINE

Ian T. Barnish, Ramsgate; Peter E. Cross, and John C. Danilewicz, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

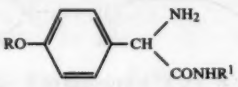
Filed Oct. 30, 1978, Ser. No. 955,644

Claims priority, application United Kingdom, Nov. 30, 1977, 49975/77

Int. Cl.[2] C07C *103/52, 103/28*

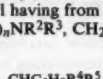
U.S. Cl. 424—319 **20 Claims**

1. L- and DL-isomers of a compound of the formula

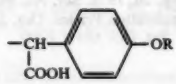


and the pharmaceutically acceptable salts thereof, wherein R is hydrogen or methyl;

R^1 is a member selected from the group consisting of alkynyl, alkenyl, cycloalkyl, each having from three to seven carbon atoms, alkyl having from one to six carbon atoms, CH_2COOH, $(CH_2)_nNR^2R^3$, $CH_2C_6H_3R^4R^5$,



dihydroxyalkyl having from three to four carbon atoms wherein said hydroxy groups are attached to different carbon atoms, and alkyl having from two to six carbon atoms substituted by up to two unlike members selected from the group consisting of hydroxy, alkoxy having from one to six carbon atoms, carboxy, $C_6H_3R^4R^5$ and $OC_6H_3R^4R^5$ provided that when two of said members are present and are hydroxy and said alkoxy, said members are attached to different carbon atoms; n is 1 to 4, R^2 and R^3 are each hydrogen or alkyl having from one to four carbon atoms; R^4 and R^5 are each hydrogen, hydroxy, alkyl or alkoxy having from one to four carbon atoms; further provided that R^1 is other than



4,218,475

HYPOLIPIDEMIC BENZYLAMINOBENZENE ALKANOIC OR ALKENOIC ACIDS

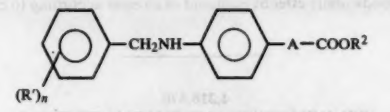
Eugene R. Wagner, Carmel; Donald P. Matthews, Indianapolis, and Alfred A. Renzi, Zionsville, all of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 26, 1978, Ser. No. 955,041

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—319 **7 Claims**

1. A method for lowering serum lipids in a mammal which comprises administering an effective hypolipidemic amount of a compound of the formula



wherein R' independently and at each occurrence represents halogen, lower alkyl, lower alkoxy, or together where n=2 methylenedioxol;

R^2 is hydrogen or lower alkyl;

n is the integer 0, 1, 2 or 3; and

A is ethylidene or a saturated hydrocarbon of the general formula $-(CH_2)_m-$ wherein m is an integer of from 2 to about 3 with the proviso that when m is 3, R' is not methylenedioxol and further including the pharmaceutically-acceptable salts of the acid.

4,218,476

ANTI-THROMBOTIC N-ALKYLTHIOAKYLAMINO BENZENESULFONAMIDES

Åake N. Jöensson, Solna; Ferenc Mérenyi, Taeby; Pinchas Moses, Saltsjoe-Boo; Lennart E. Karlsson, Vaellingby, and Gunnar Hanshoff, Jaerfaella, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

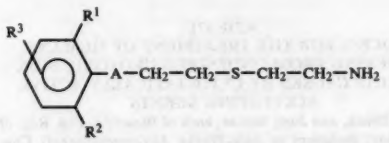
Filed Aug. 3, 1978, Ser. No. 930,614

Claims priority, application United Kingdom, Aug. 5, 1977, 32946/77

Int. Cl.[2] C07C *143/76, 143/78;* **A61K** *31/18, 31/63*

U.S. Cl. 424—321 **18 Claims**

1. A di-orthosubstituted benzene compound characterised in that it has the general formula (I)



(I)

wherein R^1 and R^2 each independently represent an alkyl group containing 1 to 4 carbon atoms, or analkoxy group containing 1 to 3 carbon atoms, or halogen, R^3 represents hydrogen, halogen, an alkyl group containing 1 to 4 carbon atoms, an alkoxy group containing 1 to 3 carbon atoms, an amino group or a nitro group, A represents

which is bonded to the benzene ring by its sulphur or nitrogen atom and in which R^4 is hydrogen or an alkyl group containing 1 to 4 carbon atoms; together with salts thereof with physio-

logically acceptable acids and, when R^4 is hydrogen, with physiologically acceptable bases.

10. A method or treatment for inhibiting formation of thrombosis or combatting thrombosis or supplementing fibrnolytic therapy which comprises administering to a host in need of such treatment a compound or salt according to any one of claims 1, 2, 7 or 8 in an amount effective for inhibiting formation of thrombosis or for combatting thrombosis or for supplementing fibronolytic therapy.

4,218,477

PRIMARY AMINOACYLANILIDES, METHODS OF MAKING THE SAME AND USE AS ANTIARRHYTHMIC DRUGS

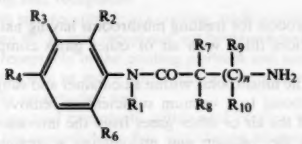
Robert N. Boyes, Auburn; Benjamin R. Duce, Westborough; Emil R. Smith, Shrewsbury, and Eugene W. Byrnes, Holden, all of Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 442,775, Feb. 15, 1974, abandoned, Division of Ser. No. 321,590, Jan. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 107,031, Jul. 28, 1971, abandoned, and a continuation-in-part of Ser. No. 424,116, Dec. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 321,590, Jan. 8, 1973, abandoned, and Ser. No. 321,800, Jan. 8, 1973, abandoned, each is a continuation-in-part of Ser. No. 167,031, Jul. 28, 1971, abandoned. This application Jan. 22, 1976, Ser. No. 651,420

Int. Cl.[2] A61K *31/165*

U.S. Cl. 424—324 **51 Claims**

1. A process for the suppression of cardiac arrhythmias in mammals comprising administering to the mammal an amount effective for the suppression of cardiac arrhythmias of a compound selected from the group consisting of



wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, and propyl, R_2 is selected from the group consisting of methyl, ethyl, chlorine, methoxy, and ethoxy, R_3 is selected from the group consisting of hydrogen and methyl, R_4 is selected from the group consisting of hydrogen, methyl, and a C_1–C_4 alkoxy group, R_6 is selected from the group consisting of methyl, ethyl, chlorine, methoxy, and ethoxy, R_7 is selected from the group consisting of hydrogen, methyl and ethyl, R_8 is hydrogen, R_9 is selected from the group consisting of hydrogen, methyl and ethyl, R_{10} is hydrogen, and n is 0 or 1, provided that

when R_1 is hydrogen, R_2 is methyl, R_3 is hydrogen, R_6 is methyl, R_7 and R_8 are hydrogen, and n is 0, then R_4 can be methyl, ethoxy, propoxy, or butoxy only; the optically active isomers of such compounds as have an asymmetric carbon atom, and the therapeutically acceptable salts thereof.

4,218,478

TRICHOSTATIN AS AN ANTIPROTOZOAL AGENT

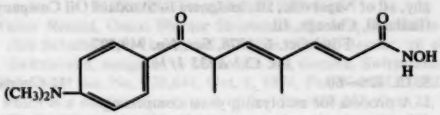
Satoshi Omura, 5-12-7 Seta, Setagaya-ku, Tokyo, and Ruiko Oiwa, 384 Hazawacho, Kanagawa-ku, Yokohama, both of Japan

Filed Jan. 5, 1979, Ser. No. 1,246

Int. Cl.[2] A61K *31/165, 31/16*

U.S. Cl. 424—324 **3 Claims**

1. A method of treating human and animal diseases caused by protozoal infections comprising administering to humans or animals in need of anti-protozoal treatment an anti-protozoal therapeutically effective amount of a compound having the structural formula:



4,218,479

NOVEL BENZYLALCOHOLS AND PHARMACEUTICAL COMPOSITIONS AND USE THEREOF

Muneyoshi Ikezaki, Ageo; Hisao Otsuka, Omiya; Hajime Iwai, Hasuda; Masanori Inamasu, Misato, and Takashi Morita, Kawagoe, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed May 18, 1978, Ser. No. 906,965

Claims priority, application Japan, Jun. 2, 1977, 52-65405

Int. Cl.[2] A61K *31/135*; C07C *91/16, 91/22, 91/34*

U.S. Cl. 424—330 **6 Claims**

1. Racemic α-(2,3,4-trimethoxyphenethylaminomethyl)-2-hydroxybenzylalcohol or a pharmaceutically acceptable acid addition salt thereof.

3. A pharmaceutical composition consisting essentially of a therapeutically effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,218,480

PRODUCTION OF PARTICULATED STALE BREAD

David V. Dyson, Richmond Hill; Kenneth S. Darley, Whitby, and Michael A. F. Fenn, Ajax, all of Canada, assignors to The Griffith Laboratories, Limited, Scarborough, Canada

Filed Dec. 29, 1978, Ser. No. 366

Int. Cl.[2] A21D *6/00*

U.S. Cl. 426—19 **15 Claims**

1. A continuous process for the manufacture of stale bread suitable for comminution to form particulated bread, which comprises:

feeding bread-forming components including flour and water to a continuous mixing zone in quantities such that the total quantity of moisture in the bread-making components is about 38 to about 50% by weight,

advancing the bread-forming components in plug flow manner through said mixing zone in about 20 to about 180 seconds,

introducing at least one inert gas to said bread-forming components at a plurality of locations during the passage of said components through said zone at a gas flow rate of about 1.3 to about 30 SCFH/100 lb. of bread-forming components,

subjecting said bread-forming components and introduced inert gas to conditions of high shear within said mixing zone such that the work done on the materials within the mixing zone varies from about 7.5 to about 20 watt hr/lb of bread-forming components to cause mixing of said components and distribution of gaseous material within the mixture,

subjecting said bread-forming components and introduced inert gas to an elevated temperature within said mixing zone during at least a major proportion of the time of passage thereof through said mixing zone to cause partial gelation of starch material contained in said bread-forming components while also subjecting the bread-forming components to a back pressure of about 50 to about 500 psig,

extruding dough having an internal temperature of about 90° to about 130° F. from said mixing zone, and

substantially immediately after said extrusion, baking said extruded dough using electromagnetic radiation under conditions such as to result in a baked bread having an internal temperature of about 180° to about 215° F.

4,218,481
YEAST AUTOLYSIS PROCESS

Kwei C. Chao; Edward F. McCarthy, and George A. McConaghy, all of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 6, 1978, Ser. No. 949,207
Int. Cl.[2] A23J *1/18*
U.S. Cl. 426—60 11 Claims

1. A process for autolyzing yeast comprising:

(a) adding to an aqueous slurry of active yeast cells at least one enzyme selected from the group consisting of papain, ficin, bromelain, pancreatin, and aspergillus protease such that the concentration of said added enzyme(s) in the slurry is within the range of about 0.01 to about 1.0 percent by weight; and

(b) incubating the slurry containing the added enzyme(s) at a temperature of about 40° to about 60° C. and a pH of about 5.0 to about 7.5 for about 2 to about 24 hours with continuous mixing to yield an autolyzed yeast slurry.

4,218,482
FROZEN, NUTRITIOUS PET FOOD

C. Dale Cook, Worthington; William J. Tyznik, and Peter F. DeMarco, both of Columbus, all of Ohio, assignors to Detyzco, Inc., Columbus, Ohio

Filed Feb. 5, 1979, Ser. No. 9,739
Int. Cl.[2] A23L *1/30*
U.S. Cl. 426—72 9 Claims

1. A pet food comprising:

a frozen, substantially homogeneous mixture of water and, dispersed in said water, emulsified oil, minute gas bubbles, peptizing and emulsifying agents, colloidal particles of high protein source, emulsified, unsaturated animal fat, and emulsified and dissolved vitamins and minerals and having essentially no added sugar component.

8. A method for manufacturing a pet food comprising:

(a) grinding a dried mixture of a high protein source, animal fat, emulsifying and peptizing agents, vitamins and minerals into very fine particles appropriate for forming a colloidal suspension in water;

(b) mixing said ground particles, oil, water and minute air bubbles into a substantially homogeneous mixture; and

(c) freezing said mixture.

4,218,483
CASEIN-BASED DIETETIC FOODSTUFF AND PROCESS FOR ITS PRODUCTION

Walter Küppers, Reinheim, and Pasquale Della Mura, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 16, 1979, Ser. No. 12,788
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1978, 2806514
Int. Cl.[2] A23L *1/30*
U.S. Cl. 426—72 16 Claims

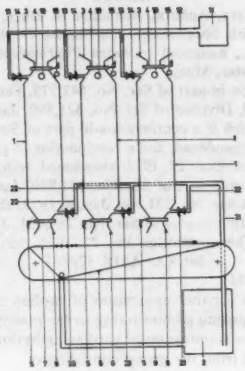
1. A dietetic foodstuff granulate having a low rate of decomposition in the digestive tract comprising casein and about 0.4–2 weight percent of carob flour based on the weight of dry casein.

7. A process for preparing a dietetic foodstuff granulate, which comprises mixing casein with about 0.4 to 2 parts by weight of carob flour based on the weight of dry casein; mixing therewith an amount of water effective to permit granulation of the mixture of casein and carob flour; granulating and then drying the mixture.

4,218,484
PROCESS FOR TREATMENT OF MUSHROOMS

Maurice Blanchaud, and Edgar Bournier, both of Chace, France (49580)

Continuation of Ser. No. 750,451, Dec. 14, 1976, Pat. No. 4,143,167, which is a continuation-in-part of Ser. No. 608,272, Aug. 27, 1975, abandoned. This application Aug. 7, 1978, Ser. No. 931,673
The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.
Int. Cl.[2] A23B *1/00*
U.S. Cl. 426—262 9 Claims



1. The process for treating mushrooms having natural juices and interstices filled with air or other gases comprising the steps of

placing the mushrooms within a container and subjecting the mushrooms to a vacuum sufficient to remove at least a part of the air or other gases from the interstices;

relieving the vacuum and introducing a treatment liquid containing an edible colloidal substance of the type adapted to coagulate under heat into the container to contact the mushrooms with the treatment liquid;

filling the interstice portions of the mushrooms with an effective amount of the treatment liquid to retain the natural juices, the said filled treatment liquid containing some of the edible colloidal substance;

removing the remainder of the treatment liquid from the container; and

coagulating an effective amount of the edible colloidal substance contained in the filled treatment liquid within the interstice portions to obstruct the filled interstice portions, whereby natural aromas, color and appearance of the mushrooms are retained.

4,218,485
PROCESS FOR PREPARING A BAKED COATED COMESTIBLE

Jean Lee, Dover, Del.; Janice R. Shaw, Yonkers; Carmine Giuliano, Hartsdale, both of N.Y., and Ned Butera, Bourbonnais, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,746
Int. Cl.[2] A23L *1/01, 1/176*
U.S. Cl. 426—296 14 Claims

8. A dry coating composition, which, when coated onto a moistened comestible and then baked on a surface coated with a oil or fat imparts the resultant comestible with the taste texture and appearance of a fried coated comestible consisting essentially of: 67–80% of a farinaceous material, the farina-

ceous material containing 5–75% of bread crumbs consisting essentially of wheat flour, yeast and salt, and having an elongated, porous and striated shape and structure and 5–75% of a flour containing 5–70% of a corn flour and; and 6–22% of a binding agent, the binding agent containing 3–19% of a starch and 3–19% of a dextrin having a DE within the range of 5–50, all percentages being by weight of the total dry coating composition.

4,218,486

PROCESS FOR PACKAGING, COOLING AND STORING FOOD ITEMS

Anne C. Bieler, Greenville, and Milton A. Howe, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 544,728, Jan. 28, 1975, abandoned. This application Jan. 8, 1979, Ser. No. 1,649

Int. Cl.[2] A23L *3/10*

U.S. Cl. 426—412 **6 Claims**

1. An improved method of preparing food products for chilled unfrozen storage comprising the steps of:

(a) providing a food product with a minimum temperature of 180° F., said food product having a tendency to solidify upon cooling from 180° F. to below 40° F. but above its freezing temperature;

(b) providing a flexible receptacle having low gas and moisture permeability;

(c) filling said receptacle with a quantity of food product at said minimum temperature so that said food product is mobile within said receptacle and the walls of the filled receptacle remain flexible and the receptacle can freely change shape;

(d) closing said receptacle;

(e) placing said receptacle in a cooling medium maintained at less than 40° F. said receptacle not being connected to any other receptacle in the cooling medium and said receptacle being free to move within the medium independently of other receptacles; and,

(f) tumbling said receptacle within said cooling medium to cause the receptacle to flex and change its shape and the food product to move within the receptacle to such an extent sufficient to reduce the temperature of the food from the 180° F. to less than 40° F. but above its freezing temperature in less than 30 minutes consequently restricting microbial growth within said food product and to prevent the accumulation of any solidified fats, derived from the food product, on the interior walls of the receptacle.

4,218,487

PROCESSES FOR PREPARING FLAVORING COMPOSITIONS

Kurt Jaeggi, Greifensee, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed May 23, 1978, Ser. No. 908,599

Claims priority, application Luxembourg, May 31, 1977, 77456; Switzerland, Apr. 7, 1978, 3771/78

Int. Cl.[2] A23L *1/226, 1/231*

U.S. Cl. 426—533 **9 Claims**

1. A process for the manufacture of synthetic flavorants, which process comprises heating at a temperature within the range from about 50° C. to about 180° C. for a time sufficient for reaction up to about 2 hours, a mixture containing about 0.5 wt.% to about 75 wt.% of an amino sugar in which the alcoholic group in the 1- or 2- position has been replaced by an amino group; about 1.5% to 45% of an amino acid, or a pyrolytic degration product thereof; and about 0.5% and 95% of a polyalcohol and/or water.

4,218,488

USE OF SPIRANE DERIVATIVES TO IMPROVE THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS, FEEDSTUFFS, OR BEVERAGES

Walter Renold, Onex; Werner Skorianetz, Geneva; Karl-Heinrich Schulte-Elte, Onex, and Gunther Ohloff, Bernex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

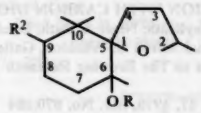
Division of Ser. No. 728,644, Oct. 1, 1976, Pat. No. 4,120,830, which is a continuation-in-part of Ser. No. 625,452, Oct. 23, 1975, Pat. No. 4,014,905, which is a continuation-in-part of Ser. No. 542,072, Jan. 17, 1975, abandoned. This application Jul. 5, 1978, Ser. No. 922,181

Claims priority, application Switzerland, Feb. 4, 1974, 1488/74; Jun. 7, 1974, 7776/74; Jul. 30, 1975, 9920/75

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—536 **5 Claims**

1. A process for improving, enhancing or modifying the organoleptic properties of foodstuffs, feedstuffs, or beverages which comprises adding thereto an amount effective to enhance or develop the woody, amber-like and earthy note thereof of a substantially pure spirane derivative of the formula



wherein the symbol R represents a hydrogen atom or an alkanoyl radical containing from 1 to 6 carbon atoms and R^2 represents a hydrogen atom or a methyl radical.

4,218,489

ANTIOXIDANTS, ANTIOXIDANT COMPOSITIONS AND METHODS OF PREPARING AND USING SAME

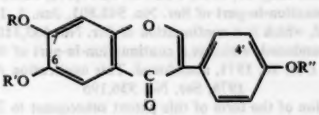
Fritz W. Zilliken, Remagen, Fed. Rep. of Germany, assignor to Z-L Limited Partnership, Janesville, Wis.

Division of Ser. No. 804,594, Jun. 8, 1977, Pat. No. 4,157,984. This application Jan. 17, 1979, Ser. No. 4,029

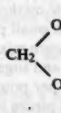
Int. Cl.[2] A23D *5/04, 3/04*

U.S. Cl. 426—545 **19 Claims**

1. A stabilized edible fat or oil containing an effective amount of an antioxidant composition, said antioxidant composition consisting essentially of at least two compounds having the structure:



wherein each R, R′ and R″ may be a methyl group or hydrogen or wherein R and R′ are replaced by CH_2 to form the linkage



provided that one of the compounds has the structure wherein R and R″ is a hydrogen and R′ is a methyl: said compounds being present in amounts relative to each other in the range of 1:5 to 5:1.

4,218,490

FUNCTIONAL PROTEINS

David J. Phillips, Plasmarl; David T. Jones, Ystalyfera, and Douglas E. Palmer, West Cross, all of Wales, assignors to Viscose Group Limited, Croydon, England

Filed Apr. 20, 1977, Ser. No. 789,436
Claims priority, application United Kingdom, Apr. 23, 1976, 16674/76
Int. Cl.[2] A23J 3/00; A21D 13/00; A23L 1/31, 2/00
U.S. Cl. 426—549 10 Claims

1. In a process for preparing edible foodstuff materials containing water which comprises at least one of the steps of (a) foaming, (b) stabilizing a foam, (c) binding water, (d) binding fat and (e) gelling by the use of a surface-active protein agent to alter the surface tension of the edible material, the improvement, which comprises; employing as the surface-active agent a surface-active protein agent containing 90 percent or more by weight of protein which has been prepared by extraction from a surface-active protein source by ion-exchange interaction with an ion-exchange material followed by recovery from the ion-exchange material.

4,218,491

HOP EXTRACTION WITH CARBON DIOXIDE

Derek R. J. Laws, Bexleyheath; Nigel A. Bath, London; Colin S. Ennis, Chislehurst, and Alfred G. Wheldon, Galley Wood, all of England, assignors to The Brewing Research Foundation, England

Filed Jan. 17, 1978, Ser. No. 870,084
Claims priority, application United Kingdom, Jan. 18, 1977, 1944/77
Int. Cl.[2] C12C 3/00, 9/02
U.S. Cl. 426—600 9 Claims

1. A method of making a high purity hop extract comprising α-acids, β-acids and hop oil, and having no more than 0.5% tannin and 0.5% hard resins, which consists essentially of passing liquid carbon dioxide at a temperature of from −5° C. to +15° C. through a column of hop material to extract at least a portion of the α-acids contained in the hops into the liquid carbon dioxide and subsequently evaporating the carbon dioxide, in equipment which is chemically inert to the extract, to thereby recover said hop extract of high purity.

4,218,492

BACON PROCESSED PRODUCT

Emmett T. Stead, LaGrange, Ill., and Ray A. Kennedy, Sioux City, Iowa, assignors to Micromatic, Inc., Sioux City, Iowa

Continuation-in-part of Ser. No. 918,583, Jun. 23, 1978, abandoned, which is a continuation of Ser. No. 748,329, Dec. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 608,338, Aug. 27, 1975, Pat. No. 3,997,672, which is a continuation-in-part of Ser. No. 545,801, Jan. 1, 1975, abandoned, which is a continuation of Ser. No. 403,315, Oct. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 208,892, Dec. 16, 1971, abandoned. This application Aug. 24, 1978, Ser. No. 936,195
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.[2] A22C 11/00
U.S. Cl. 426—646 11 Claims

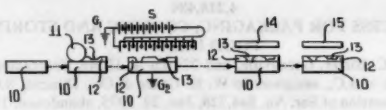
1. A processed bacon product having a bright red meat appearance containing no salts of nitrite and nitrate and no vegetable matter formed by the method comprising the steps of chopping fresh pork meat into small pieces, feeding are of said pieces together with a bacon cure mixture comprised of pepsin 1.0%–2.0%, salt 79.0%–81% and sugar 20.00%–17% at a ratio of about 0.04 pounds of cure per pound of meat into grinding apparatus while grinding said pieces into a homogeneous mass at a temperature of between 40° F. and 50° F. said cure being effected while the meat is in contact with said cure mixture during said grinding, molding said product into a desired shape without the addition of a vegetable binder and chilling to a temperature sufficient to cause the product to maintain its homogeneous molded shape.

4,218,493

ELECTROSTATIC REPAIR COATING

Kenneth W. Rarey, Santa Ana, Calif., assignor to The Continental Group, Inc., New York, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,996
Int. Cl.[2] B05D 1/06, 1/36, 3/02
U.S. Cl. 427—27 11 Claims



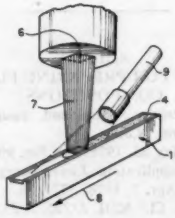
1. A method of repairing areas of flaws of an electrically insulating, substantially uniform thickness basecoat on an electrically conductive substrate, the flaws including reductions in thickness of the basecoat, said method comprising the steps of overall electrostatically charging the basecoat with a charge of a given polarity while said substrate is maintained at a lesser degree of said given polarity with the areas of flaws of the charged basecoat being influenced by the electrically conductive characteristics of the conductive base and the charging of the basecoat and exhibiting a fringing field effect, electrostatically charging a repair material with a charge of the same polarity as that of the charged basecoat, applying the charged repair material uniformly to the charged basecoat and the areas of flaws with the charged repair material directed towards unflawed portions of said basecoat being repelled and the charged repair material striking said basecoat adjacent said flaws being attracted by the fringing field effect to the areas of flaws, and curing the added basecoat material to provide an overall basecoat of uniform thickness.

4,218,494

PROCESS FOR COATING A METALLIC SURFACE WITH A WEAR-RESISTANT MATERIAL

Armando Belmondo, Pietraporzio, and Massimo Castagna, Turin, both of Italy, assignors to Centro Richerche Fiat S.p.A., Orbassano, Italy

Filed Jul. 2, 1979, Ser. No. 54,056
Claims priority, application Italy, Jul. 4, 1978, 68564 A/78
Int. Cl.[2] C23C 17/00
U.S. Cl. 427—35 28 Claims



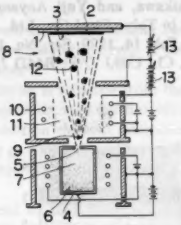
1. A process for coating the surface of a metallic substrate with a wear-resistant material, which comprises depositing on the said surface a uniform layer of an intimate mixture of a coating powder including a metallic carbide with powdery silicon and heating said layer by exposure to a source of high density energy to an extent and for a period sufficient to bring about simultaneously evaporation of said silicon and fusion of said coating powder, and bonding of said layer to said substrate.

4,218,495

SCHOTTKY BARRIER TYPE SOLID-STATE ELEMENT

Toshinori Takagi, Nagaokakyo; Kiyoshi Morimoto, and Yukihiko Utamura, both of Mobara, all of Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Division of Ser. No. 705,696, Jul. 15, 1976, Pat. No. 4,139,857.
This application Aug. 21, 1978, Ser. No. 935,154
Claims priority, application Japan, Jul. 18, 1975, 50-87254; Nov. 22, 1975, 50-139750; Nov. 22, 1975, 50-139751
Int. Cl.[2] C23C *15/00*; C09K *11/10*
U.S. Cl. 427—42 7 Claims



1. A method of producing a Schottky barrier type solid-state element comprising the steps of:

selecting a metallic board, at least the surface layer of which is formed of a metal which is capable of forming a Schottky barrier between itself and a semiconductor material to be deposited on said surface,

forming a Schottky barrier type element portion through the step of depositing a semiconductor film layer on said surface,

said step of depositing including the step of using the ionized-cluster-beam deposition process which vaporizes a material to be deposited, injects said vapor into a vacuum region of about 10^{-2} Torr or less to form aggregates of atoms called clusters, bombards said clusters with electrons to ionize a part of each cluster thereby producing ionized clusters, and accelerates said ionized clusters to let them impinge on said surface thereby forming a film layer thereon; and,

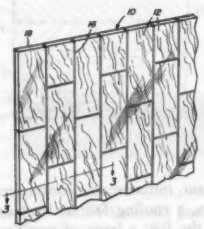
providing at least one terminal on said semiconductor film layer so as to form an ohmic contact therewith.

4,218,496

NATURAL STONE PANEL AND METHOD OF MAKING SAME

Manuel E. Savignac, P.O. Box 10475, El Paso, Tex. 79995

Filed Sep. 25, 1978, Ser. No. 945,319
Claims priority, application Mexico, Mar. 16, 1978, 172784
Int. Cl.[2] B05D *5/00, 1/36*; B44F *9/04*; B32B *3/16*
U.S. Cl. 427—263 7 Claims



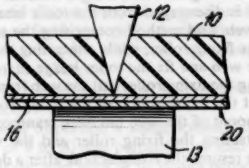
1. A method for making a decorative natural stone panel from blocks of natural stone, fiberglass backing, and an adhesive including dust formed from the same stone material as forms said blocks, a curing agent, and a resin, the method comprising the steps of arranging on a horizontal work surface an array of said blocks of natural stone, placing a roll of said fiberglass backing along one edge of said array, forming said adhesive by combining said dust, said curing agent and said resin, unrolling said roll and simultaneously applying said adhesive to the space between said blocks to the upper surface of said roll, smoothing said fiberglass backing upon said blocks, curing the adhesive to form a hardened resin and a rigid unit having end edges, lifting the rigid unit from said work surface, and subsequently polishing the exposed surface of said blocks to a high gloss, and applying to said polished blocks a protective coating.

4,218,497

METHOD FOR DIE CUTTING A PLASTIC WEB

Leroy O. Stringham, Clearwater, Fla., and Michael J. Lawrence, Chicago, Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed May 21, 1979, Ser. No. 40,502
Int. Cl.[2] B05D *3/12*
U.S. Cl. 427—289 13 Claims



1. An improved method for continuously die cutting a plastic or paper web including the step of conveying the web to a cutter member disposed adjacent one surface of the web, there being a support member disposed adjacent the opposite surface of the web aligned with the cutter member for supporting the web, the improvement comprising the steps of applying to a portion of the surface of the web coming in contact with said support member, a frangible, but non-splintering coating before the web reaches the cutter; and cutting the web by penetrating the entire thickness thereof, said coating contacting the support member and having a thickness such that the cutter, while penetrating the entire thickness of the web, does not come into contact with said support member.

4,218,498

PROCESS FOR PREPARING A POLYMERIC FILM

David L. Cohen, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 19, 1975, Ser. No. 605,889
Claims priority, application United Kingdom, Aug. 21, 1974, 36739/74
Int. Cl.[2] B05D *3/10*
U.S. Cl. 427—336 5 Claims

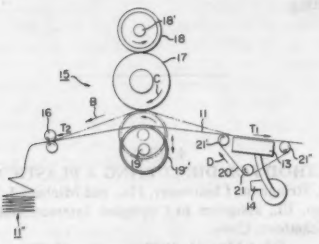
1. A method of preparing a polymeric film comprising the steps of applying a layer of solution of the polymer in a volatile solvent therefor to a support, heating the solution to evaporate at least part of the solvent and, before the polymer is dry, applying to the surface of the polymer layer a surfactant which is soluble in the polymer solution.

4,218,499

METHOD OF FIXING HEAT-FUSIBLE TONER IMAGES FORMED ON A WEB

Yukimasa Shinohara, Yokohama, and Hiroo Ichihashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,141
Claims priority, application Japan, Jul. 30, 1976, 51-91834
Int. Cl.[2] G03G *15/20*
U.S. Cl. 427—444 10 Claims



1. A method of intermittently fixing a toner image formed on a web by intermittently transporting the web to a heated fixing roller for heat fusing the toner image, wherein the fixing roller contacts and is disengaged from the toner image bearing surface of the web, said method comprising the steps of:

rotating the fixing roller, while contacting the web, to transport the web and fix the toner image thereon;

disengaging the fixing roller and the web from each other, to interrupt the fixing action of the fixing roller, after a desired amount of the web has been transported;

again contacting the fixing roller and the web with each other, to resume the fixing action, after a desired interruption period has elapsed;

stopping the rotation of the roller at the time of or before the time when the roller and the web are again contacted with each other; and

resuming the rotation of the fixing roller, to transport the web, a predetermined time after the roller and the web are again contacted with each other;

whereby a toner image is not disturbed when contacted with the fixing roller.

4,218,500

SAFETY GLAZING CONTAINING SUPPORT FOR ATTACHMENT OF LABELS

Helmer Rädisch, Aachen, Fed. Rep. of Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 765,110, Feb. 2, 1977, abandoned. This application Oct. 18, 1978, Ser. No. 952,234
Claims priority, application France, Feb. 12, 1976, 76 03814
Int. Cl.[2] B32B *3/14*
U.S. Cl. 428—78 15 Claims

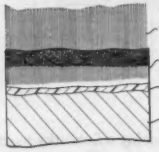
1. In a safety windshield comprising a safety glass laminate of a plurality of solid glass sheets and an adherent transparent inner layer of polyvinylbutyral and having bonded to at least one outer glass sheet of said laminate, an adherent solid transparent layer of polyurethane, the improvement which comprises adhesively attaching to said self-healing polyurethane layer, a hard scratch-resistant plastic layer having surface dimensions of about 0.1 to about 1% of the total surface area of the self-healing layer and curing the adhesive at a temperature above about 100° C. and a pressure above about 3 bars greater than atmospheric pressure.

4,218,501

ELECTROSTATIC FLOCK-COATED METAL SHEET WITH EXCELLENT CORROSION RESISTANCE AND FABRICABILITY

Toru Kameya, Ichikawa, and Yuji Aoyama, Tokyo, both of Japan, assignors to Taiyo Steel Co., Ltd., Japan

Filed Feb. 14, 1979, Ser. No. 12,194
Int. Cl.[2] C09J *7/00;* B44D *1/44*
U.S. Cl. 428—90 3 Claims



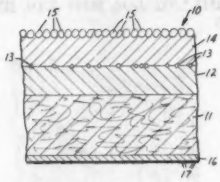
1. A flock-coated metal sheet with excellent corrosion resistance and fabricability, comprising (a) an anticorrosive synthetic resin layer containing 2 to 30 parts by weight of an anticorrosive pigmemt per 100 parts by weight of the resin with a thickness of 2 to 20 microns as a dried film on the surface of a metal sheet, (b) an elastic adhesive layer with a thickness of 50 to 500 microns as a dried film on a partial or the entire surface of said anticorrosive synthetic resin layer, and (c) flock-coated synthetic resin pile on said adhesive layer, applied by means of an electrostatic flock-coating machine.

4,218,502

INTUMESCABLE FIRE-RETARDANT PRODUCTS

Joseph Graham, Oakdale, Minn., and James R. Lodge, deceased, late of Little Canada, Minn. (by Jean I. Lodge, personal representative), assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 19, 1978, Ser. No. 916,941
Int. Cl.[2] B32B *5/16, 11/02, 9/00*
U.S. Cl. 428—144 34 Claims



1. Fire-retardant, intumescable roofing material comprising in parallel layers, a roofing felt; at least one asphalt coating disposed above the felt; a layer of roofing granules partially embedded in the top asphalt coating in the roofing material; and a layer of intumescable particles disposed within the roofing material and comprising, in at least a 25-micrometer-diameter core, hydrated soluble silicate glass which intumesces when heated to 300° or less.

4,218,503

X-RAY LITHOGRAPHIC MASK USING RARE EARTH AND TRANSITION ELEMENT COMPOUNDS AND METHOD OF FABRICATION THEREOF

John P. Reekstin, and Howard L. Glass, both of Orange, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 857,061, Dec. 2, 1977, abandoned. This application Feb. 9, 1979, Ser. No. 10,433

Int. Cl.[2] B32B *3/10;* B05D *5/06*

U.S. Cl. 428—195 4 Claims

1. A high resolution mask formed by the steps of;

providing a substrate which is substantially transparent to x-ray radiation,

disposing a layer of masking material on a surface of said substrate which masking material is substantially opaque to x-ray radiation,

said masking material is selected from the class comprising rare earth compounds, rare earth oxides, mixed rare earth oxides, and transition element compounds,

directly exposing portions of said layer to E-beam radiation to alter the solubility of the exposed portions of the said layer, and

applying a solvent to said layer to remove parts thereof which are readily soluble in said solvent thereby to establish a pattern of said layer on said substrate.

4,218,504

HEAT-SENSITIVE RECORDING PAPER

Noboru Yamato, and Tosimi Satake, both of Tokyo, Japan, assignors to Jujo Paper Co. Ltd., Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,635

Claims priority, application Japan, Dec. 28, 1977, 52-158264

Int. Cl.[2] B41M *5/18;* B32B *5/16*

U.S. Cl. 428—207 6 Claims

1. A heat-sensitive recording paper having an excellent recording aptitude for thermal recording equipment containing a phenolic substance and one colorless or thin-colored chromogenic dyestuff selected from the group consisting of lactone, lactam and spiropyrane in the color-developing layer, said color-developing layer containing calcined clay or calcined aluminum oxide.

4,218,505

PRODUCTION OF POLYURETHANE-SPLIT LEATHER LAMINATE

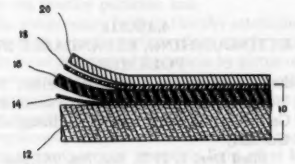
Yasuhiro Shiga, and Yoshikazu Hida, both of Osaka, Japan, assignors to Toyo Cloth Co., Ltd., Sennan, Japan

Filed Mar. 25, 1977, Ser. No. 781,528

Claims priority, application Japan, Apr. 1, 1976, 51-36779; Nov. 2, 1976, 51-132064

Int. Cl.[2] B32B *3/26, 5/20, 9/02*

U.S. Cl. 428—306 2 Claims



1. A polyurethane-split leather laminate comprising:

(a) a split leather hide substrate;

(b) a porous polyurethane foam layer foamed in-situ and containing from between 10% and 50% by weight of its resin content a particulate filler selected from the group consisting of pulverized cellulose pulp, glass microballoons, zeolite or zeoclite, said foam layer being laminated to said substrate by compatible polymeric adhesive; and

(c) a top coating of polyurethane elastomer bonded in surface to surface contact to said foam layer, said foam layer functioning as a cushion to prevent uneven reduction in the thickness of said top coating when the laminate is folded or stretched.

4,218,506

RECORDING MATERIAL AND METHOD FOR THE PRODUCTION OF THE SAME

Shinichi Oda; Shoji Aoyagi; Takio Kuroda, and Eishun Tozaki, all of Hyogo, Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1978, Ser. No. 936,207

Claims priority, application Japan, Aug. 31, 1977, 52-105381; Apr. 24, 1978, 53-49663

Int. Cl.[2] B32B *27/18;* B41M *5/22*

U.S. Cl. 428—327 12 Claims

7. A recording material comprising a base sheet and a color former coating layer formed on a surface of said base sheet said color former coating layer including microcapsules each encapsulating a hydrophobic color former material therein, said recording material produced by the steps of:

a. preparing an aqueous dispersion of said microcapsules each having a capsule wall of a gelated hydrophilic colloid material and containing a hydrophobic color former material therein;

b. adding to said dispersion at least one hardener for said hydrophillic colloid material selected from the group consisting of aldehydes, diketones, epoxides, acid anhydrides and acid chlorides;

c. hardening said capsule walls of said microcapsules with said hardener;

d. adding to said dispersion a water soluble alkali-salt of a copolymer of 8 to 90 mol percent of at least one olefinic monocarboxylic acid with 92 to 10 mol percent of at least one monomer copolymerizable with said olefinic monocarboxylic acid to form a coating composition, said water soluble alkali salt of a copolymer having a surface tension of at least 40 dyne/cm in a 1 weight percent aqueous solution, the amount of said water soluble alkali salt of a copolymer included in said dispersion being within the range of 0.5 to 50 parts by weight with respect to 100 parts by weight of said hydrophobic material of said microcapsules; and

e. coating a surface of said base sheet with said coating composition to form said color former layer.

4,218,507

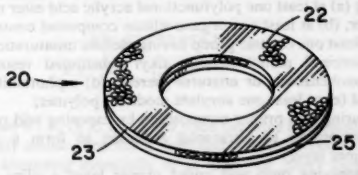
COATED PARTICLES AND PROCESS OF PREPARING SAME

Robert J. Deffeyes, and Grover L. Johnson, both of Arlington, Tex., assignors to Graham Magnetics, Inc., Ft. Worth, Tex.

Division of Ser. No. 783,075, Mar. 30, 1977, Pat. No. 4,137,361, which is a continuation-in-part of Ser. No. 540,521, Jan. 13, 1975, Pat. No. 4,092,459. This application Sep. 8, 1978, Ser. No. 940,827

Int. Cl.[2] B32B *15/02;* B22F *1/02*

U.S. Cl. 428—328 18 Claims



1. An electroconductive composition of matter character-

ized by microwave shielding capability and consisting essentially of (1) a mass of small particles formed of a core material and of a thin external coating on said core material, of an electrically-conductive member selected from the group consisting of a carbide, boride or silicide and (2) a resin matrix within which said particles are dispersed in particle-to-particle contact and wherein said composition has an electoresistivity of less than 2500 ohm centimeters

11. A process for forming chemically inert and electrically conductive metal-surface-bearing powders, a mass of which is characterized by a resistivity of less than about 2500 ohm centimeters, said process comprising the steps of

(1) forming on said metal-surface, a coating of a compound selected from an electrically conductive silicide, carbide or boride, and

(2) limiting the thickness of said surface layer to less than 10 atomic layers of said coating.

4,218,508

POLYCARBONATE ARTICLES COATED WITH AN ADHERENT, DURABLE SILICA FILLED ORGANOPOLYSILOXANE COATING AND PROCESS FOR PRODUCING SAME

James S. Humphrey, Jr., Clemmons, N.C., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 895,943, Apr. 12, 1978, abandoned. This application Apr. 30, 1979, Ser. No. 34,434

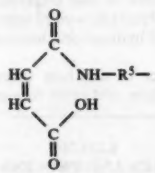
Int. Cl.[2] **B32B** *31/28, 27/08;* **B29D** *11/00;* **G02B** *1/04*

U.S. Cl. 428—331 **55 Claims**

1. A coated polycarbonate article having improved resistance to abrasion comprising a polycarbonate substrate coated with (i) an adhesion promoting primer layer comprising a photoreaction product of (a) at least one polyfunctional acrylic acid ester monomer; (b) at least one organo-silicon compound containing at least one organic group having olefinic unsaturation represented by the general formula

$$R^4_cSiX_{4-c}$$

wherein c is an integer having a value from 1 to 3 inclusive, x is an alkoxy, acyloxy and aryloxy radical, and R^4 represents a radical selected from $CH_2{=}CH{-}COO{-}R^5{-}$, $CH_2{=}CCH_3{-}COO{-}R^5{-}$, and



wherein R^5 is a divalent saturated aliphatic hydrocarbon radical; (c) at least one acrylate modified polymer; and (ii) a colloidal silica filled thermoset organopolysiloxane top coat disposed on said primer layer.

37. A process for producing a mar, abrasion, scratch and chemical solvent resistant coated polycarbonate article comprising the steps of:

(i) applying onto the surface of a polycarbonate substrate an ultraviolet radiation curable primer composition containing (a) at least one polyfunctional acrylic acid ester monomer, (b) at least one organo-silicon compound containing at least one organic group having olefinic unsaturation, (c) resorcinol monobenzoate, alkyl substituted resorcinol monobenzoate, or mixtures thereof, (d) a photoinitiator, and (e) at least one acrylate modified polymer;

(ii) curing said primer composition by exposing said primer composition to ultraviolet radiation to form a cured primer layer;

(iii) applying onto said cured primer layer a silica filled further curable organopolysiloxane top coat composition comprising a dispersion of colloidal silica in a lower aliphatic-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is an alkyl radical containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of said silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0;

(iv) evaporating the volatile solvents from said top coat composition; and

(v) applying heat to said composition to cure said top coat composition, whereby said silanol is condensed further to a silsesquioxane.

4,218,509

POLYAMIDE COPOLYMERS

Owen B. Edgar, Manchester, and Michael R. Yates, Leeds, both of England, assignors to Imperial Chemical Industries, Limited, London, England

Division of Ser. No. 407,679, Oct. 18, 1973, Pat No. 3,926,924, Continuation of Ser. No. 201,966, Nov. 24, 1971, abandoned, which is a continuation of Ser. No. 578,521, Sep. 12, 1966, abandoned. This application Mar. 13, 1975, Ser. No. 558,032 The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.[2] **C08G** *69/16, 69/24*

U.S. Cl. 528—339 **2 Claims**

1. A filament or fibre consisting essentially of a ternary copolyamide consisting essentially of at least 50% by weight, based on the weight of the copolyamide, of hexamethylene adipamide units together with 20% to 40% by weight of hexamethylene terephthalamide units and 2% to 20% by weight of hexamethylene isophthalamide units.

4,218,510

SELF UNIFIED, HEAT SEALABLE, MULTILAYER FILM

Karl S. Willson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 2, 1979, Ser. No. 433

Int. Cl.[2] **B32B** *27/34, 27/32, 27/36*

U.S. Cl. 428—349 **25 Claims**

1. A self-unified, heat-sealable, multilayer film structure comprising two organic film layers chemically interfacially bonded to one another, the interfacial bond being so strong that said layers cannot be mechanically separated, said organic film layers comprising

a layer of biaxially oriented and heat-set polyester film and

a layer of polyolefinic film having a density of less than about 0.94 g/cm^3 and being transmissive to ultraviolet radiation, said polyolefinic film being selected from polyethylene and copolymers of ethylene, and said layer of polyolefinic film containing from about 250 to 750 parts per million of a fatty acid amide containing at least 8 carbon atoms.

4,218,511

SELF-EXTINGUISHING, EXPANDABLE STYRENE POLYMERS

Klaus Hahn, Lampertheim; Manfred Walter, Speyer; Karl Stange, Neustadt, and Heinz Weber, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1978, Ser. No. 965,266

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2757020

Int. Cl.[2] **B32B** *1/00*

U.S. Cl. 428—407 **9 Claims**

1. A molding composition which comprises: self-extinguishing, thermoplastic particles of a styrene polymer having a size of from 0.4 to 3 mm and containing volatile blowing agents,

which particles are surface-coated by simple tumbling with from 0.05 to 2.0 percent by weight, based on the expandable styrene polymer, of an organic bromine compound A, and wherein the surface additionally carries, mixed with the bromine compound, from 0.005 to 1.0 percent by weight of a N-hydroxyphenylbenzotriazole or of a hydroxybenzophenone as stabilizer B.

4,218,512

STRENGTHENED TRANSLUCENT GLASS-CERAMICS AND METHOD OF MAKING

Ties Allersma, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 4, 1979, Ser. No. 862
Int. Cl.[2] C03C *21/00*
U.S. Cl. 428—410 **9 Claims**

1. A method for producing strengthened, translucent, crystallized glass-ceramic articles, comprising the steps of:

heating a glassy article comprising by weight:

SiO_2	67–73
Al_2O_3	18–21
TiO_2	1.4–5.0
Li_2O	2.5–5.0
ZrO_2	0–2.0
ZnO	0.5–2.0
Sb_2O_3	0–1.0
As_2O_5	0–1.0
Na_2O	0–1.0
K_2O	0–1.0
Cl_2	0–0.2
F_2	0–0.5
MgO	0–3.0
CaO	0–4.0
P_2O_5	0–1.5

to a first temperature range within which beta-eucryptite crystallization takes place;

maintaining the article within said first temperature range for a time sufficient to transform substantially the entire article to a predominantly crystalline phase of the beta-eucryptite form;

raising the temperature of the crystallized article sufficiently slowly and uniformly to avoid thermal imbalances in the article to a second temperature range within which beta-eucryptite transforms to beta-spodumene and wherein the transformation from beta-eucryptite to beta-spodumene in surface portions of the article is retarded relative to the transformation in interior portions of the article;

maintaining the article within said second temperature range for a sufficient time to transform the predominant crystal form within interior portions of the article to beta-spodumene, but insufficient to complete transformation of the beta-eucryptite in surface portions of the article;

reducing the temperature of the article below said second temperature range so as to fix the beta-eucryptite content of the surface portions at a substantially higher concentration than the interior portions; and

reducing the temperature further, thereby establishing zones of compression near the surface of the article and zones of tension in inner portions of the article by virtue of a difference between the coefficient of thermal expansion of the beta-eucryptite-rich surface portions and the beta-eucryptite-poor interior portions.

6. A strengthened, translucent, crystallized glass-ceramic article having a transparency to visible light of at least 30% through a 4 to 5 millimeter thickness and a bulk composition comprising by weight:

SiO_2	67–73
Al_2O_3	18–21
TiO_2	1.4–5.0
Li_2O	2.5–5.0

-continued

ZrO_2	0–2.0
ZnO	0.5–2.0
Sb_2O_3	0–1.0
As_2O_5	O–1.0
Na_2O	0–1.0
K_2O	0–1.0
Cl_2	0–0.2
F_2	0–0.5
MgO	0–3.0
CaO	0–4.0
P_2O_5	0–1.5

and comprising a predominant crystalline phase dispersed in a glassy matrix, the majority of the crystalline phase of the bulk of the article being beta-spodumene, and the majority of the crystalline phase at the surface of the article being beta-eucryptite, so that surface portions of the article are stressed in compression and interior portions of the article are stressed in tension due to different coefficients of thermal expansion.

4,218,513

POLYMER COMPOSITE ARTICLES CONTAINING AMINO SUBSTITUTED MERCAPTO ORGANO SILICON COUPLING AGENTS

Thomas C. Williams, Ridgefield, Conn., and George E. Totten, West Haverstraw, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 810,786, Jun. 28, 1977, Pat. No. 4,156,677. This application Feb. 15, 1979, Ser. No. 12,482
Int. Cl.[2] B32B *17/04, 17/10*; C08K *9/06*
U.S. Cl. 428—419 **21 Claims**

1. An inorganic substrate treated with an organosilicon coupling agent selected from the class consisting of (i) amino substituted mercapto organosilanes having the formula

$$X_{4-(a+b)}-Si\left(\begin{matrix}R'_b\\|\end{matrix}\right)-[(R)_n(Q)_tCH(SH)CH_2Z]_a \quad (I)$$

wherein R' is a monovalent hydrocarbon radical selected from the class consisting of hydrogen, hydrocarbon radicals and substituted hydrocarbon radicals.

wherein X is a hydrolyzable radical selected from the class consisting of alkoxy, aryloxy, acyloxy, secondary amino and aminooxy radicals;

wherein R is a divalent bridging group selected from the class consisting of hydrocarbon radicals, groups of the formula —R"OR"— and groups of the formula —R"SR"—, wherein R" is a divalent hydrocarbon radical;

wherein Q is an oxygen atom or a sulfur atom;

wherein Z is a monovalent organic amino radical, the nitrogen atom of which is directly bonded to the carbon atom of the (CH_2) group of the above formula;

wherein n has a value of 0 or 1, and t has a value of 0 or 1, with the proviso that when n is 0, then t is 0;

wherein a has a value of 1 to 3 and b has a value of 0 to 2, with the proviso that the sum of (a+b) is not greater than 3; (ii) amino substituted mercapto organosiloxane homopolymers consisting essentially of siloxy units having the formula

$$\left(\begin{matrix}[(R)_n(Q)_tCH(SH)CH_2Z]_a\\|\end{matrix}\right)-SiO_{4-\frac{(a+b)}{2}} \quad (II)$$

wherein R', R, Q, Z, n, t, a and b are the same as defined above; and (iii) amino substituted mercapto organosiloxane copolymers consisting essentially of at least one siloxy unit represented by formula (II) above and at least one siloxy unit represented by the formula

$$R'_cSiO_{\frac{4-c}{2}} \quad \text{(III)}$$

wherein R' is the same as defined in formula (II) above and wherein c has a value from 0 to 3 inclusive.

4,218,514

PROCESS FOR PREPARING WATERLESS PRINTING MASTERS

Thomas J. Pacansky, and Alan B. Amidon, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 10, 1977, Ser. No. 776,150

The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.

Int. Cl.[2] B41N *1/06*; G03F *7/02*

U.S. Cl. 428—447 **2 Claims**

1. A printing master having image areas of ink receptivity and nonimage areas of ink releasability comprising a self-supporting master substrate and an overlying layer of a film forming crosslinked block copolymer of from 80 to 90 weight percent elastomeric siloxane blocks and 10 to 20 weight percent of image accepting polymeric styrene blocks, said image accepting polymeric styrene blocks having a molecular weight of between 6,000 and 11,000.

4,218,515

ACRYLATE-CYANOACETATE-UREADIACETOACETAMIDE-DIACETOACETAMIDE COPOLYMERS USEFUL AS PROTECTIVE SURFACES

John S. Heckles, 1408 Springside Dr., Lancaster, Pa. 17603

Filed May 14, 1979, Ser. No. 38,548

Int. Cl.[2] B32B *27/08, 27/30, 27/34*

U.S. Cl. 428—474 **20 Claims**

1. A cross-linked acrylate-cyanoacetate-ureadiacetoacetamide copolymer produced by the reaction of at least one polyfunctional acrylate with at least one cyanoacetate, and at least one ureadiacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate, the cyanoacetate and the ureadiacetoacetamide.

2. A cross-linked acrylate-cyanoacetate-diacetoacetamide copolymer produced by the reaction of at least one polyfunctional acrylate with at least one cyanoacetate, and at least one diacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate, the cyanoacetate and the diacetoacetamide.

3. A cross-linked random acrylate-cyanoacetate-ureadiacetoacetamide-diacetoacetamide copolymer produced by the reaction of at least one polyfunctional acrylate with at least one cyanoacetate, at least one ureadiacetoacetamide and at least one diacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate, the cyanoacetate, the ureadiacetoacetamide, and the diacetoacetamide.

11. A thermoplastic floor covering coated with a wear layer composition comprising a cross-linked acrylate-cyanoacetate-ureadiacetoacetamide copolymer produced by the reaction of at least one polyfunctional acrylate with at least one cyanoacetate, and at least one ureadiacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate and the ureadiacetoacetamide.

12. A thermoplastic floor covering coated with a wear layer composition comprising a cross-linked acrylate-cyanoacetate-diacetoacetamide copolymer produced by the reaction of at least one polyfunctional acrylate with at least one cyanoacetate, and at least one diacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate, the cyanoacetate and the diacetoacetamide.

4,218,516

PIGMENT FOR BLOCKING TANNIN MIGRATION

Victor E. Meyer, and Rex R. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1979, Ser. No. 6,622

Int. Cl.[2] B32B *33/00, 21/04, 21/12*

U.S. Cl. 428—537 **6 Claims**

1. The process of inhibiting the staining of a film-forming finish applied to a tannin-containing wood substrate which comprises the step of applying to the wood substrate, prior to or concurrently with the film-forming finish, a latex primer paint containing from about 1.0 to about 20.0 weight percent of magnesium hydroxide based on the total weight of the solvent system, said magnesium hydroxide having a surface area of at least 50 square meters per gram, thereby forming a leach-resistant magnesium hydroxide-tannin complex.

4,218,517

ARTICLE OF MANUFACTURE HAVING A METALLIC SURFACE COATED WITH AN ELASTOMER AND AN INTERMEDIATE COBALT-COPPER ALLOY COATING TO IMPROVE THE ADHESION OF THE ELASTOMER

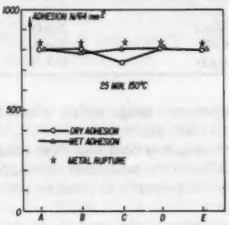
Willy J. Van Ooij, Dieren, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Feb. 27, 1978, Ser. No. 881,677

Claims priority, application Netherlands, Mar. 11, 1977, 7702643

Int. Cl.[2] B32B *15/06*

U.S. Cl. 428—614 **10 Claims**



1. A steel wire for reinforcing a sulphur vulcanizable elastomeric article, said steel wire being covered with a thin coating of a copper-cobalt alloy with a face-centered cubic structure, said alloy containing 10 to 70 percent by weight of copper and the balance cobalt, said coating being provided to improve adhesion of the elastomer to the wire, the thickness of the alloy coating being from about 30 to about 750 nm and the total diameter of the wire being within the range of from 0.05 to 0.75 mm.

2. The article of claim 1 in the form of a vehicle tire.

3. The article of claim 1 in the form of a conveyor belt.

4,218,518

FUEL CELL USE OF GASEOUS FUELS AND OXYGEN PROVIDED AT ELECTRODE ABSORBED IN LIQUID DIELECTRIC

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Filed Jan. 17, 1979, Ser. No. 4,067

Int. Cl.[2] H01M *8/06*

U.S. Cl. 429—14 **4 Claims**

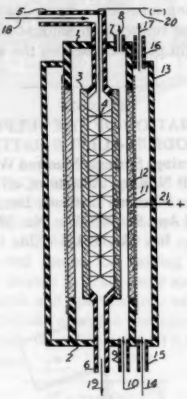
1. An improvement in the process of production by electrochemical direct conversion of chemicals to electric energy consisting of the steps of;

absorbing oxygen gas in an inert dielectric liquid which is also immiscible with water,

replacing the dry gas compartment fluid of a conventional fuel cell with the oxygen saturated dielectric liquid,

adjusting the pressure differential between the electrolyte compartment and the oxygen carrier liquid compartment

so electrolyte wets porous electrode but doesn't leak to oxygen carrier compartment,
circulating the oxygen saturated, inert dielectric liquid through the cell compartment which is for the oxygen contact with the oxygen electrode,
carrying water of reactions from the cell with the dielectric to a waste separator,
gravity separating the water from the dielectric liquid,
disposing of the water,
recycling the dielectric liquid,
replenishing the electrolyte with controlled quality, specified electrolyte,
recycling the electrolyte through quality control,



providing a fuel to the cell which produces an E.M.F. across the cells electrodes and terminals,
said fuel being either a liquid naturally, or absorbing said fuel, if gases, in an inert dielectric liquid,
recirculating said fuel through the fuel compartment of the cell,
replenishing said fuel as required for continuous E.M.F. production,
connecting individual cells in series to amplify the individual cell voltage to a predetermined quantity,
separating the water of reaction,
disposing of the water.

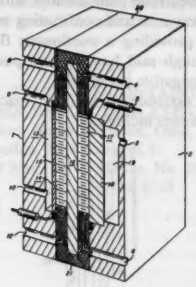
4,218,519

CONFIGURATION FOR A GAS REDOX FUEL CELL EMPLOYING AN ION EXCHANGE MEMBRANE

Steven N. Frank, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 1, 1978, Ser. No. 938,749
Int. Cl.² H01M *8/04*
U.S. Cl. 429—15 **9 Claims**

1. In a fuel cell for providing an electrical current in response to the electrochemical reactions of oxidants and reductants, and wherein said cell contains an anode, a cathode, and an ion exchange membrane disposed between a first electrolyte-containing chamber and a second electrolyte-containing chamber, the improvement comprising removing from the first electrolyte-containing chamber impurity-containing electrolyte therein while maintaining said impurity-containing electrolyte separate from the electrolyte of said second elec-



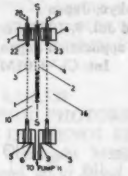
trolyte-containing chamber, and replacing the removed electrolyte with essentially pure electrolyte.

4,218,520

APPARATUS FOR GENERATING HEAT AND ELECTRICAL ENERGY FROM ALUMINUM WASTE AND OTHER INEXPENSIVE ALUMINUM PRODUCTS

Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Division of Ser. No. 843,155, Oct. 17, 1977, Pat. No. 4,150,197, which is a continuation-in-part of Ser. No. 704,452, Jul. 12, 1976, abandoned. This application Mar. 16, 1979, Ser. No. 20,967
Int. Cl.² H01M *8/06*
U.S. Cl. 429—15 **20 Claims**



1. Apparatus for generating heat and electrical energy from the consumption of a variety of aluminum products which comprises:
(a) a reaction chamber containing aqueous electrolyte solution and adapted for introduction therein of aluminum pieces of various shapes and sizes up to a certain maximum predetermined size and for effecting a chemical reaction between said aqueous electrolyte and said aluminum pieces yielding an aluminum hydroxide reaction product;
(b) means for feeding said aluminum pieces into said reaction chamber in small quantities upon demand;
(c) means for removing the heat generated in said chamber as a result of said reaction;
(d) means for removing said aluminum hydroxide reaction product; and
(e) means for generating electricity as a by-product of said reaction.

4,218,521

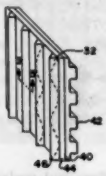
METAL-HALOGEN BATTERY HAVING REDUCED DENDRITE GROWTH

Ronald A. Putt, Palatine, and Mark J. Montgomery, Lake Zurich, both of Ill., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 8, 1978, Ser. No. 967,863
Int. Cl.² H01M *2/14, 12/06*
U.S. Cl. 429—39 **7 Claims**

1. A metal-halogen battery, comprising:

(a) a housing;
(b) a positive electrode plate located within said housing;
(c) a negative electrode plate located within said housing in spaced relation with and confronting said positive plate;
(d) means for providing a continuous flow of electrolyte solution through said housing and past the confronting face of said negative plate; and
(e) means for maintaining uniform spacing between said plates, said means including



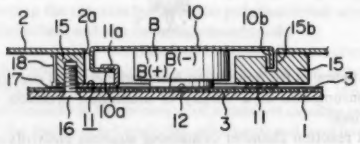
(i) a main body located between said plates in a fixed position relative to said positive plate, and
(ii) a plurality of electrically non-conductive, spaced projections, each of which extends out from said main body a distance sufficient to engage the confronting face of said negative plate at its free end, each of said projections having a cross-section which is wider at predetermined points between said engaging free end and main body than at its plate engaging free end.

4,218,522

BATTERY MOUNTING DEVICE

Junichi Motoyoshi, Ichikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,807
Claims priority, application Japan, Jul. 13, 1978, 53-85457
Int. Cl.[2] H01M 2/10
U.S. Cl. 429—97 **6 Claims**



1. A battery mounting device, comprising:
a casing of an electronic apparatus;
a negative contact provided in said casing;
a positive contact provided in said casing;
an electroconductive battery cover to be maintained in contact with the anode face of a battery; and
engaging latch members provided between said electroconductive battery cover and said positive contact, and provided with slanted faces structured to bias said battery toward said negative contact when said battery cover is turned.

4,218,523

NONAQUEOUS ELECTROCHEMICAL CELL

Tibor Kalnoki-Kis, Westlake, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 15,938
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—101 **16 Claims**

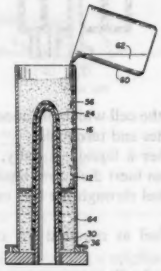
1. A nonaqueous cell comprising an active metal anode, a cathode collector and an ionically conductive cathode-electrolyte solution containing a solute dissolved in at least one liquid oxyhalide of an element of Group V or Group VI of the Periodic Table, the improvement comprising incorporating into said cathode-electrolyte at least one sulfurcontaining member represented by the formula $M_xS_yY_z$ wherein M is an alkali or alkaline earth metal, S is sulfur and Y is chlorine or bromine and wherein x is an integer having a value of 0 to 2, y is an integer having a value of 1 to 14, and z is an integer having a value of 0 to 2, with the proviso that when z is other than 0 then x is 0, that when x is other than 0 then z is 0, when x and z are 0 and the oxyhalide employed does not form sulfur as a cell discharge product, then the sulfur incorporated in the cathode-electrolyte is from 1 weight percent based on the weight of the cathode-electrolyte up to the quantity of sulfur that will dissolve in the cathode-electrolyte at ambient temperature and pressure, and that when x or z are other than 0, then the sulfur-containing member is incorporated in the cathode-electrolyte contains sulfur in an amount between about 0.05 and about 10 weight percent based on the weight of the cathode-electrolyte.

4,218,524

IN-SITU PREPARATION OF THE SULFUR ELECTRODE FOR SODIUM-SULFUR BATTERIES

Bruce S. Dunn, Saratoga Springs; Manfred W. Breiter, Schenectady, and Randall N. King, Johnstown, all of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 9, 1979, Ser. No. 28,468
Int. Cl.[2] H01M 4/36
U.S. Cl. 429—104 **7 Claims**



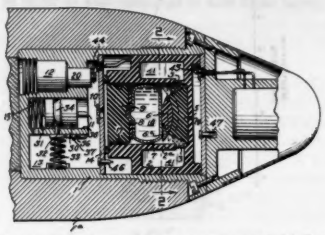
1. An improved sodium/sulfur battery having a sulfur electrode, a sodium electrode and a solid electrolyte intermediate said two electrodes, formed by the method of:
(a) introducing small relatively low electrically resistive carbon fibrils and molten sulfur into a sulfur compartment of a sodium/sulfur battery; and
(b) positioning in said sulfur compartment, a highly resistive carbonaceous layer, intermediate said solid electrolyte and said sulfur electrode, said layer being positioned so as to fit about the solid electrolyte present in said sulfur compartment in order to provide graduated resistance from said solid electrolyte to the wall of said compartment.

5. A method for preparing the sulfur electrode in a sodium/-sulfur battery which comprises applying to the surface of the solid electrolyte a thin layer of a high electrically resistive carbonaceous material;
positioning said solid electrolyte with said layer in the sulfur compartment of said sodium/sulfur battery;
introducing small relatively low electrically resistive carbon fibrils into said sulfur compartment to a predetermined height and a porosity in the range of about 90 to 98%; and
introducing molten sulfur into said compartment to substantially completely coat said layer and said fibrils.

4,218,525
RESERVE TYPE BATTERY

Paul J. Selgin, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 21, 1949, Ser. No. 116,882
Int. Cl.² H01M 6/38
U.S. Cl. 429—114 2 Claims

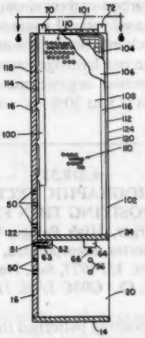


1. A reserve battery comprising a cell, spaced electrodes in said cell, a filling aperture in said cell, a frangible sealed ampule containing electrolyte, a plunger adjacent said ampule, a conduit between said ampule and said cell aperture, a body of sealing material, and means for moving said plunger into contact with said ampule to crush same and force electrolyte through said conduit and aperture into said cell, said means being so constructed and arranged that upon further motion of said plunger the body of sealing material is disposed across the aperture to seal same.

4,218,526
INDUSTRIAL BATTERY STACK

Hector L. DiGiacomo, Lafayette Hill, and John A. Sacco, Wernersville, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 895,482, Apr. 11, 1978, abandoned, which is a division of Ser. No. 783,959, Apr. 1, 1977, Pat. No. 4,114,260, which is a division of Ser. No. 652,715, Jan. 27, 1976, abandoned. This application May 18, 1979, Ser. No. 40,109
Int. Cl.² H01M 2/18
U.S. Cl. 429—138 3 Claims

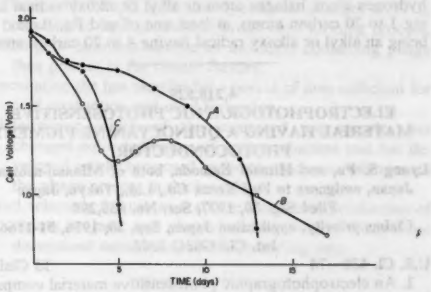


1. A positive industrial battery plate comprising:
(a) a lead battery plate;
(b) a semi-perforate wrapping material disposed around said plate; and
(c) spacing means disposed along one edge of said plate to prevent said wrapping material from contacting a contiguous surface disposed adjacent to said plate, said spacing means comprising clamp means for engaging the wrapped edge of said battery plate, and spacing projections disposed on said clamp means for spacing said wrapped edge of said battery plate from said contiguous surface.

4,218,527
LEAD DIOXIDE/FLUORIDE-CONTAINING CATHODES FOR SOLID ELECTROLYTE CELLS

Geoffrey W. Mellors, North Royalton, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,588
Int. Cl.² H01M 6/18
U.S. Cl. 429—191 13 Claims

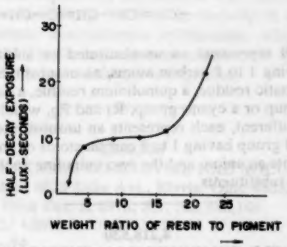


1. a cathode for use in an electrochemical cell comprising a mixture of lead dioxide (PbO_2) having a water content of between about 0.4 and about 10 percent by weight with a metal fluoride in a mole ratio of between about 3:1 and about 1:3.

4,218,528
ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH PHTHALOCYANINE IN PHENOL RESIN BINDER

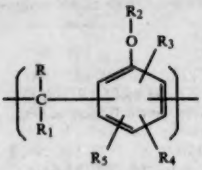
Fumio Shimada, Fussa; Masatoshi Matsuzaki, Nino, and Masafumi Uehara, Koganei, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1978, Ser. No. 913,668
Claims priority, application Japan, Jun. 27, 1977, 52-76359; Feb. 7, 1978, 53-12685
Int. Cl.² G03G 5/06
U.S. Cl. 430—76 4 Claims



1. An electrophotographic photoreceptor consisting essentially of a resin and a photoconductive phthalocyanine pigment dispersed in said resin in a ratio by weight of said pigment to said resin of 1:3 to 1:20, adapted for use in forming an electrostatic image in an electrophotography, wherein said resin comprises a phenol resin having a polymerization degree of

from 2 to 10,000 consisting essentially of a substance having the following formula



where R and R_1 are a hydrogen atom or methyl radical; R_2 a hydrogen atom or epoxy radical; and R_3, R_4 and R_5 are a hydrogen atom, halogen atom or alkyl or alkoxy radical having 1 to 20 carbon atoms, at least one of said R_3, R_4 and R_5 being an alkyl or alkoxy radical having 4 to 20 carbon atoms.

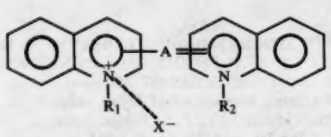
4,218,529

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL HAVING A QUINOCYANINE PIGMENT PHOTOCONDUCTOR

Lyong S. Pu, and Hitoshi Kamoda, both of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

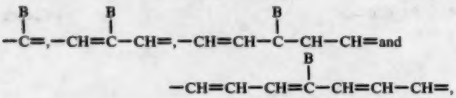
Filed Sep. 30, 1977, Ser. No. 838,290
Claims priority, application Japan, Sep. 30, 1976, 51-116640
Int. Cl.[2] G03G *5/06*
U.S. Cl. 430—78 **15 Claims**

1. An electrophotographic photosensitive material comprising an electrically conductive support having thereon a photoconductive layer consisting essentially of an organic photoconductive material and a binder, in which the photoconductive layer contains in a dispersed state a photoconductive quinocyanine pigment having a particle size of about 5μ or less represented by the following general formula (I)



(I)

wherein A is selected from the group consisting of



wherein B represents an unsubstituted or substituted alkyl group having 1 to 8 carbon atoms, an unsubstituted or substituted aromatic residue, a quinolinium residue, a halogen atom, a nitro group or a cyano group, R_1 and R_2, which may be the same or different, each represents an unsubstituted or substituted alkyl group having 1 to 8 carbon atoms or an allyl group; X represents an anion; and the two quinoline nuclei may have additional substituents.

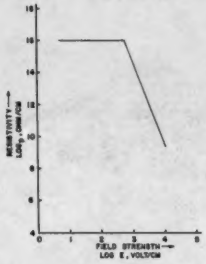
4,218,530

SINGLE COMPONENT MAGNETIC TONER

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 792,636, May 2, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,410
Int. Cl.[2] G03G *13/09*
U.S. Cl. 430—107 **29 Claims**

1. A single component, electrically field dependent developer comprising toner particles, said particles comprising a resin and magnetic particles coated with a surfactant, the surfactant being present in an amount of about 0.1 to about 10 weight percent of the magnetic material, said magnetic material being present at higher concentration near the toner particle surface than in the interior of particle the toner is characterized by a field dependence such that at low fields of less than 100 volt/cm the resistivity is greater than 10^{12} ohm-cm, and less than 10^{12} ohm-cm at fields greater than 100 volt-cm, some higher field they exhibit along a line of a slope greater than 5 when log of powder resistivity is plotted versus the log of the field in volt-cm.



4,218,531

ADDITION OF ETHYLENICALLY UNSATURATED MATERIALS TO CONTROL ODOR IN PHOTOPOLYMERIZABLE EPOXY COMPOSITIONS

Robert C. Carlson, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 8, 1978, Ser. No. 876,113
Int. Cl.[2] G03C *1/68*; C08F *8/18, 8/34*
U.S. Cl. 430—280 **5 Claims**

1. A photopolymerizable composition comprising:
(a) a first organic material containing epoxide functionality and being polymerizable to higher molecular weight;
(b) aromatic sulfonium complex salt, said salt being photodecomposable and being capable of initiating polymerization of said first organic material upon exposure to actinic radiation; and
(c) a second organic material containing at least one site of non-aromatic carbon-carbon unsaturation; wherein said unsaturation in said second organic material is ethylenic and wherein each ethylenically unsaturated carbon atom has no more than one hydrogen atom bonded thereto; and wherein said second organic material is present in an amount of about 0.5 to 20% by weight of said composition.

4,218,532

PHOTOLITHOGRAPHIC TECHNIQUE FOR DEPOSITING THIN FILMS

LaRue N. Dunkleberger, High Bridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 13, 1977, Ser. No. 841,797
Int. Cl.[2] G03C *5/00, 11/00*
U.S. Cl. 430—314 **12 Claims**

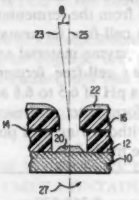
1. A method of depositing patterned thin films on a substrate comprising:
(1) forming on said substrate a first layer of positive-acting photoresist material which can be patterned after exposure to optical radiation and which is soluble in a solvent which does not attack adjacent layers; and exposing said entire first layer to said radiation prior to step (2);
(2) forming a protective second layer on said first layer to a thickness in the range of approximately 50–200 Angstroms effective to protect it from dissolution during the subse-

quent formation of the positive-acting photoresist of step (3);

(3) forming a positive-acting photoresist third layer on said second layer;

(4) patterning said positive-acting photoresist third layer to form openings therein which extend to said second layer;

(5) patterning said second layer to form openings therein which extend to said first layer, and which are substantially aligned with said openings in said third layer and at least as large as said openings in said third layer;



(6) patterning said first layer by exposure to said solvent, without removing said third layer, to form openings therein in substantial alignments with said openings in said third layer and of larger size than said openings in said third layer; and

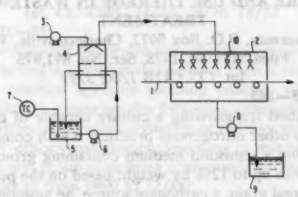
(7) depositing said thin films onto said substrate through said openings using said positive-acting photoresist third layer as a deposition mask.

4,218,533

PROCESS FOR PRODUCING PHOTOGRAPHIC MATERIAL

Shuzo Fuchigami, and Toshio Miyashiro, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 3, 1977, Ser. No. 803,187
Claims priority, application Japan, Jun. 4, 1976, 51-65453
Int. Cl.² G03C *1/76*
U.S. Cl. 430—512 **18 Claims**



1. A process for producing a photographic material which comprises applying a coating composition to a continuously travelling support, cold-setting the coating and then drying the coating; wherein the process includes atomizing a part or all of an additive to be incorporated in the coating composition by ultrasonic vibration, and supplying the atomized additive to the coating on the support, or supplying the atomized additive to the surface of the support and then coating the coating composition on the support before the additive thereon is completely dried.

4,218,534

PHAGE DETECTION

Gerald G. LaBelle, and Glenn E. Staehler, both of Waukesha, Wis., assignors to Dairyland Food Laboratories, Inc., Waukesha, Wis.

Filed Feb. 21, 1979, Ser. No. 13,001
Int. Cl.² C12Q *1/70*
U.S. Cl. 435—5 **17 Claims**

1. A method for selecting a cheese starter culture resistant to the bacteriophage currently present in a cheese factory comprising the steps of,

preparing a multiplicity of test samples of different strains or blends of starter cultures differing one from another and corresponding to the cultures available to the cheesemaker, each sample being in a sterile medium to which has been added a pH indicator dye which changes color in response to acid production in the curd forming process,

adding to each test sample an inoculant containing phage then present in the cheese factory,

incubating the test samples for a period of time sufficient for acid production and curd formation,

determining which of the incubated test samples has changed color indicative of acid production and has developed satisfactory curd to thereby indicate resistance to the phage present in the inoculant,

and selecting for use as a starter culture in production of cheese at least one phage resistant culture from those determined satisfactory in the preceding step.

4,218,535

DETERMINATION OF ENZYME SUBSTRATE CONCENTRATION

Robert A. Ray, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 667,330, Mar. 16, 1976, abandoned. This application Dec. 7, 1978, Ser. No. 967,324
Int. Cl.² G01N *31/14*; C07G *7/02*
U.S. Cl. 435—12 **19 Claims**

10. In a method for kinetically measuring enzyme substrate concentrations with linear output analyzers which monitor a rate of reaction between an enzyme present in a sample and a reagent comprising an enzyme for reacting with said substrate present in the sample, said reaction between said enzyme and said substrate possessing a Michaelis-Menten relationship between reaction rate and substrate concentration and a known value for Km forming a part of said relationship, the improvement consisting of the step of adding to said sample or reagent a nonreacting competitive inhibitor of said enzyme in an amount sufficient to increase the value of Km relative to said substrate concentration to increase the linearity of said reaction rate-substrate concentration relationship, whereby the accuracy of the kinetic measurement of substrate concentration with linear output analyzers is improved.

4,218,536

PROCESS-STABLE CO-ENZYME NAD SOLUTION

Jonas Maurukas, 6823 Lake Ave., Elyria, Ohio 44035

Filed Oct. 3, 1978, Ser. No. 948,146
Int. Cl.² C09K *3/00*; G01N *31/06, 31/14, 33/16*
U.S. Cl. 435—14 **8 Claims**

1. A solution of oxidized co-enzyme NAD stored for at least one day prior to use for use in assaying enzymes present in body fluids, said solution consisting essentially of oxidized co-enzyme NAD dissolved in a substantially anhydrous solvent of the class consisting of liquid polyols and mixtures of them, characterized in that the solution had been stored for essentially the entire time since its preparation at a temperature in the range of about 4° to −20° C.

4,218,537
MEDIUM FOR THE CULTIVATION OF MICROORGANISMS

Jean Buissiere, Paris, France, assignor to Institut Pasteur, Paris, France

Filed Jul. 28, 1976, Ser. No. 709,426
Claims priority, application France, Jul. 30, 1975, 75 23851
Int. Cl.[2] C12Q *1/04*
U.S. Cl. 435—34 **6 Claims**

1. A fluid medium, useful for microbiological work and for identification of a microorganism and mixtures of different microorganisms on the basis of their aerobic and nonaerobic growth properties, which medium need not be liquified by heating prior to inoculation, which is inert with respect to the microorganisms, is non-biodegradable and sterilizable without loss of its properties, which comprises as a viscosity control agent a synthetic or natural macromolecular substance selected from the group consisting of water-soluble derivatives of cellulose and water-soluble vinyl polymers, and which

(1) has the properties of a liquid and is innoculatable and stirable to permit microorganisms to be distributed uniformly therein by stirring prior to or after development of the microorganism;

(2) has a viscosity so low and remains so liquid that non-motile microorganisms after innoculation onto the surface of said liquid medium, sediment to the bottom of the medium by gravity alone, said liquid property being independent of exposure to heat;

(3) has, however, such viscosity with respect to gases that diffusion of atmospheric oxygen from the surface of the medium into the body thereof is virtually nil;

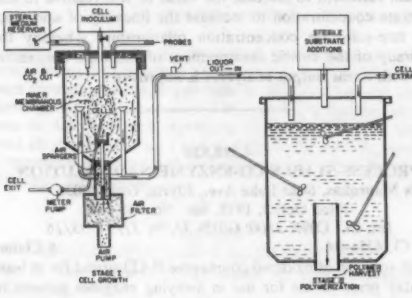
(4) said liquid and viscosity properties being stable from the time of innoculum with the microorganism through the time of cultivation and identification of said microorganism; and

(5) wherein said liquid and viscosity properties are such that (a) strict aerobic microorgainisms, even though motile do not multiply inside the medium, (b) strict anaerobic bacteria multiply only in the depth of the medium, and (c) aeroanaerobic bacteria, even though non-motile multiply at the surface and in the depth of the medium.

4,218,538
TWO STAGED CONTINUOUS FERMENTATION PROCESS FOR PRODUCTION OF HETEROPOLYSACCHARIDE

Brooks D. Church, Littleton, Colo., assignor to Inpro, Inc., Rock Island, Ill.

Filed Dec. 7, 1977, Ser. No. 858,204
Int. Cl.[2] C12Q *19/04*; C12M *1/40*; C12R *1/64*
U.S. Cl. 435—101 **6 Claims**



1. A two stage process for the production of a cell-free heteropolysaccharide polymer by the fermentation of a suitable carbohydrate with bacteria belonging to the Xanthomonas genus, wherein in the first stage, bacteria are continuously cultivated to produce exocellular polymerizing enzyme material and in the second stage, polysaccharide is produced in a cell-free system, comprising:

(a) continuously cultivating viable bacteria of the genus Xanthomanas characterized as being in the late exponential-early stationary growth phase in an inner membranous chamber of a fermentation vessel containing a carbohydrate fermentation media at a pH of 7.0 to 7.2 and at a temperature of about 28° C. under conditions suitable for maintaining the bacteria in the late exponential-early stationary growth phase and producing exocellular polyerizing enzyme material,

(b) continuously separating and transfering said exocellular enzyme material from the fermentation media to a second vessel to form a cell-free fermentation media containing said exocellular enzyme material and substrate,

(c) maintaining said cell-free fermentation media in said second vessel at a pH of 6.5 to 6.8 and at a temperature of about 28° C. to form heteropolysaccharide polymer, and

(d) continuously withdrawing said polysaccharide polymer from the cell-free media.

4,218,539
ENZYME CONJUGATES AND METHOD OF PREPARATION AND USE

Joel K. Weltman, 164 Summit Ave., Providence, R.I. 02906

Filed Mar. 24, 1978, Ser. No. 889,726
Int. Cl.[2] C12N *9/96*; G01N *33/54*
U.S. Cl. 435—188 **17 Claims**

1. A method of preparing an enzyme conjugate, which method comprises reacting at least one of the amino groups of an amino-containing nonenzyme macromolecule with an amino-reactive radical R of a coupling reagent having the formula:

$$X\text{-}(CH_2)_n\text{-}\overset{O}{\overset{\|}{C}}\text{-}R$$

wherein X is a halogen; n is a whole number of from 1 to 8; and R is an amino-reacting radical to form a reagent-macromolecule compound, and, thereafter, reacting the sulfhydryl-reacting halogen of the coupling reagent-macromolecule; with the sulfhydryl groups of an enzyme to form an enzyme-conjugate compound of the enzymatically active enzyme and the immuno-active macromolecule conjugately linked by the coupling reagent.

4,218,540
METHOD FOR GROWING A DEAMMONIFYING CULTURE AND USE THEREOF IN WASTEWATER TREATMENT

Roy A. Ackerman, P.O. Box 5072, Charlottesville, Va. 22903

Filed Mar. 30, 1978, Ser. No. 891,975
Int. Cl.[2] C12B *1/00, 3/12*
U.S. Cl. 435—243 **7 Claims**

1. A method for growing a culture capable of converting ammonia to other nitrogenous products which comprises:

a. obtaining a semisolid medium containing ground peanut hulls with up to 12% by weight based on the peanut hulls of a cereal grain, a carbonate source, an ammonia source, and a phosphate source, and an amount of water to provide a semisolid substrate;

b. inoculating the medium with a culture selected from the group of microorganisms identified as ATCC 31381, at least one of its cultures selected from the group of *Enterobacter agglomerans,* Group D Streptococcus, Bacilli, and Pseudomonad or mixtures of said culture having the identification ATCC 31381 and said at least one of its cultures;

c. incubating the inoculated medium under aerobic conditions for a time sufficient to grow said culture.

4,218,541

CONVERTING UREA WITH BACTERIA

Roy A. Ackerman, P.O. Box 5072, Charlottesville, Va. 22903

Filed Mar. 30, 1978, Ser. No. 891,976

Int. Cl.[2] C12B *1/00*

U.S. Cl. 435—262 **8 Claims**

1. A method for converting urea to inocuous products which comprises:

a. obtaining a culture having the identification ATCC 31381, or at least one of its cultures selected from the group of Enterobacter agglomerans, Group D Streptococcus, Bacilli, and Pseudomonad or mixtures of said culture having the identification ATCC 31381 and said at least one of its cultures;

b. adding said culture to a composition containing urea in an amount sufficient to degrade urea therein to inocuous product, and said culture and fluid being under aerobic conditions.

4,218,542

CATION EXCHANGE MEMBRANE OF FLUORINATED POLYMER CONTAINING POLYTETRAFLUOROETHYLENE FIBRILS FOR ELECTROLYSIS AND PREPARATION THEREOF

Hiroshi Ukihashi, Tokyo; Tatsuro Asawa, and Tomoki Gunjima, both of Yokohama, all of Japan, assignors to Asahi Glass Company Limited, Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,019

Claims priority, application Japan, Jun. 3, 1977; 52-64900

Int. Cl.[2] C25B *13/04*; C08J *5/22*

U.S. Cl. 521—27 **11 Claims**

1. A cation exchange membrane of a fluorinated polymer for electrolysis which comprises 0.5 to 2.8 wt.% of fibrils of polytetrafluoroethylene in a cation exchange resin of a perfluorocarbon polymer having sulfonic acid type ion exchange groups thereon, wherein said fibrils are formed by applying a high shear stress to particles of polytetrafluoroethylene.

4,218,543

RIM PROCESS FOR THE PRODUCTION OF ELASTIC MOLDINGS

Christian Weber, Cologne, and Hermann Schafer, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 894,227, Apr. 7, 1978, abandoned, which is a continuation of Ser. No. 803,014, Jun. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 761,166, Jan. 21, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,573

Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622951

Int. Cl.[3] C08G *18/14, 18/76, 18/32*

U.S. Cl. 521—51 **46 Claims**

1. In a process for the production of polyurethane elastomer moldings having a compact surface skin from a reaction mixture by a reaction injection molding process, wherein said reaction mixture comprises the following components:

(a) 4,4'-diisocyanatodiphenylmethane,polyisocyanates based on 4,4'-diisocyanatodiphenylmethane or mixtures thereof;

(b) hydroxyl group containing compounds having molecular weights of from 1800 to 12,000;

(c) a chain extender; and

(d) a catalyst for the reaction between hydroxyl groups and isocyanate groups;

the improvement wherein said chain extender is miscible with component (b) in any proportion and is an active aromatic diamine having alkyl groups of from 1 to 3 carbon atoms in the ortho-positions to each amino group, and wherein said components are processed via the one-shot process whereby (a) is mixed simultaneously either with (b), (c), and (d) or with a non-reacted premixture of some or all of (b), (c), and (d) or with a non-reacted premixture of some or all of (b), (c) and (d), with the proviso that at least two of said alkyl substituents contain 2 or 3 carbon atoms.

15. An active hydrogen containing blend for use in the production of polyurethane moldings comprising:

(a) an organic hydroxyl group containing compound having a molecular weight of from 1,800 to 12,000, and

(b) a chain extender which is miscible with polyhydroxyl compounds in any proportion and is selected from the group consisting of active aromatic diamines, having alkyl groups of from 1 to 3 carbon atoms in the ortho-position to each amino group, with the proviso that at least two of said alkyl substituents contain 2 or 3 carbon atoms.

4,218,544

BLENDS OF POLYCARBONATE WITH RUBBER AND MONOVINYLIDENE AROMATIC COPOLYMERS

David E. Henton, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 3, 1979, Ser. No. 35,584

Int. Cl.[2] C08L *69/00, 9/00*

U.S. Cl. 525—67 **6 Claims**

1. A heterogeneous blend comprising the following components: (1) a polycarbonate of a dihydric phenol blended with (2) a rubber component, (3) an anhydride copolymer of a monovinylidene aromatic monomer and an α,β-ethylenically unsaturated anhydride and (4) a compatible polymer of a polar monomer other than an anhydride; said rubber component containing a copolymer of a rubber polymer blocked or grafted with a portion of the anhydride copolymer and/or the polymer of the polar monomer wherein said block or graft copolymer is present in an amount sufficient to measurably increase the impact resistance of the blend, said polar monomer being a polymerizable ethylenically unsaturated organic compound which bears a polar group having a group moment in the range from about 1.4 to about 4 Debye units determined in accordance with Smyth, C. P., *Dielectric Behavior and Structure*, McGraw-Hill Book Company, Inc., New York (1955), said component being present in proportions such that the blend has (a) a Gardner Dart impact strength of at least about 100 inch-pounds, (b) a notched Izod impact strength of at least about 3 foot-pounds/inch of notch, (c) a heat resistance of at least about 225° F. as determined by ASTM D-648 (unannealed at 66 pounds per square inch) and (d) a processability (injection pressure) less than about 7500 pounds per square inch at a mold fill time of 2.5 seconds as determined by the test procedure for Injection Pressure set forth in footnote (10) of Table I hereof.

4,218,545

THERMOPLASTIC RUBBER BLENDS OF POLYCARBONATES AND BLOCK COPOLYMERS

Volker Serini, Krefeld; Manfred Beck, Odenthal; Leo Morbitzer, Cologne; Gert Humme, and Jochen Schnetger, both of Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1977, Ser. No. 780,127

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613200; Sep. 29, 1976, 2643757

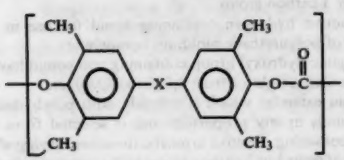
Int. Cl.[2] C08L *53/00*

U.S. Cl. 525—92 **9 Claims**

1. A mixture comprising:

(a) 99 to 1% by weight of one or more segment copolymers including partly or totally hydrogenated segment polymers of alternating linear or branched segments A and B wherein A comprises a hard segment polymeric block of aromatic vinyl compounds and B comprises a soft segment polymeric block containing polymerised conjugated dienes, said hard segment having Tg higher than 20° C. and said soft segment having Tg lower than 0° C., and

(b) 1 to 99% by weight of one or more aromatic polycarbonates in which the linear chains comprise at least 50% of structural units of the general formula



(I)

wherein X is C_1–C_5 alkylene or alkylidene.

4,218,546

POLYESTER RESINS

Brian Y. Downing, Kingswinford, and George D. Hamer, Birmingham, both of England, assignors to British Industrial Plastics Limited, Manchester, United Kingdom

Filed Oct. 14, 1977, Ser. No. 842,269

Claims priority, application United Kingdom, Oct. 16, 1976, 43076/76

Int. Cl.[2] C08L *67/06*

U.S. Cl. 525—170 **4 Claims**

1. In a polyester resin composition for use in the preparation of resin/fibre laminates which comprises a solution of an unsaturated polyester resin in a volatile monomer, the improvement comprising incorporating in said composition a thixotropic agent and a polymer which is partially incompatible with the polyester resin solution said partially incompatible polymer being formed by addition polymerization using carbon-carbon unsaturation and whose monomeric unit consists essentially of an alkyl ester of an $\alpha\beta$ unsaturated di-basic carboxylic acid, whereby monomer vapor emission is substantially reduced.

4,218,547

BLASTING MEDIA AND METHOD OF MANUFACTURE COMPRISING POLYCARBONATE AND ETHYLENE-CARBON MONOXIDE-VINYL ACETATE TERPOLYMER

Henry D. Ellis, 7739 National Turnpike, Louisville, Ky. 40214, and Lysle I. Benjamen, Bloomfield Hills, Mich., assignors to Henry D. Ellis, Louisville, Ky.

Filed Oct. 11, 1978, Ser. No. 950,506

Int. Cl.[2] C08L *69/00, 23/08*

U.S. Cl. 525—148 **3 Claims**

1. Blasting media consisting of small pellets of a resin material containing from 1% to 8% by weight vinyl acetate-carbon monoxide-ethylene terpolymer and the remainder substantially all polycarbonate resin.

4,218,548

PEROXY COMPOUNDS AND VULCANIZABLE COMPOSITIONS THEREOF

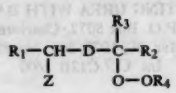
Orville L. Mageli, Kenmore, N.Y., and William A. Swarts, Dover, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 937,657, Aug. 28, 1978, Pat. No. 4,180,518. This application Jun. 20, 1979, Ser. No. 50,405

Int. Cl. C08f *8/30*

U.S. Cl. 525—387 **5 Claims**

1. In a vulcanizable composition comprising an intimate mixture of a polymeric compound capable of being crosslinked to form a thermoset material and a crosslinking agent in an amount sufficient to afford the desired degree of crosslinking, the improvement comprising using as said agent a peroxy compound of the formula:



where:

(a) R_1 is hydrogen or an alkyl of 1–4 carbons;

(b) R_2 and R_3 are an alkyl of 1–4 carbons;

(c) R_4 is t-alkyl of 4–10 carbons, t-aralkyl of 9–16 carbons, t-cycloalkyl of 6–12 carbons or

(d) Z is

(e) R_5 and R_7 are independently an alkyl of 1–8 carbons; and

(f) D is ethynyl diradical, diethynyl diradical or alkyl diradical having 1–8 carbons.

4,218,549

THERMOPLASTIC MOLDING COMPOSITIONS HAVING IMPROVED FLEXIBILITY AND COLD IMPACT STRENGTH BASED UPON POLYAMIDES FROM OMEGA-AMINOCARBOXYLIC ACIDS AND/OR LACTAMS HAVING AT LEAST 10 CARBON ATOMS

Hans Jadamus; Salih Mumcu; Klaus Burzin; Rainer Feldmann, and Roland Feinauer, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,652

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716004

Int. Cl.[2] C08L *77/00*

U.S. Cl. 525—420 **6 Claims**

1. Thermoplastic molding compositions having improved flexibility and cold impact strength, comprising a mixture of:

I. at least one polyamide homopolymer from omega-aminocarboxylic acids or lactams having at least 10 carbon atoms; and

II. at least one polyether ester amide copolymer with units of the starting components randomly distributed in the polymer chain produced from:

(a) omega-aminocarboxylic acid or lactams having at least 10 carbon atoms,

(b) alpha, omega-dihydroxy(polytetrahydrofuran) having a molecular weight of between 160 and 3,000, and

(c) a dicarboxylic acid, wherein said mixture contains about 95 to 20 percent by weight of component I and about 5 to 80 percent by weight of component II.

4,218,550

COATING COMPOSITIONS

Denis R. Pauze, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 538,079, Jan. 2, 1975, abandoned. This application Jul. 11, 1978, Ser. No. 923,729

Int. Cl.[2] C08G *63/76*

U.S. Cl. 525—437 **6 Claims**

1. A polyester hydantoin containing coating compositions having free carboxyl groups wherein all of the free carboxyl groups are neutralized with a compound selected from the group consisting of an amine, ammonia and ammonium hydroxide, said compound being used in at least fifty percent excess of that necessary to neutralize said free carboxyl groups.

4,218,551
PROCESS FOR THE PRODUCTION OF POLYBUTENE-1 FORMABLE INTO TRANSPARENT FILMS

Albert Frese, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 400,899, Sep. 26, 1973, abandoned. This application Apr. 6, 1978, Ser. No. 893,870

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1972, 2247786

Int. Cl.[2] C08F *4/66, 10/08*

U.S. Cl. 526—158 **9 Claims**

1. A process for the production of a polybutene-1 mixture formable without modification directly into transparent heat sealable films having good tear resistance in both the longitudinal and transverse direction, said polybutene-1 having an RSV of 2.0–4.5 dl./g. corresponding to a molecular weight of 76,000–2,112,000, a 10–30% ether soluble proportion, a Vicat temperature of about 105° C., 80–150 kp.cm^2 yield strength, 160–380 kp./cm^2 tensile strength at rupture and 300–600% elongation at rupture, which comprises the steps of

(a) solution polymerizing either liquid butene-1 or the butene-1 in a liquid C_4 fraction consisting of 35–95% butene-1 and one or both of butene-2 and butane, alone or in the presence of 0.1–15% by weight of an α-olefin comonomer, at 60°–120° C., to a polybutene-1 concentration in the polymerization mixture of 15–75%, employing as the polymerization catalyst a dihalide-free mixture consisting essentially of diethylaluminum monochloride and $TiCl_3.nAlCl_3$ wherein n is 0.2 to 0.6 produced by the reduction of titanium tetrachloride with an organoaluminum compound at −10° C. to +30° C., and

(b) isolating the thus-produced polybutene-1 solely by volatilizing the volatile components of the reaction mixture, whereby the mixture of polybutene-1 is not fractionated, whereby there is produced a polybutene-1 possessing said properties.

4,218,552
POLYMERS OF PIVALOYLOXYALKYL METHACRYLATES, METHOD FOR THEIR PREPARATION AND MODIFICATION

Stanislav Sevcik; Jiri Trekoval; Jan Holata, and Jiri Stamberg, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

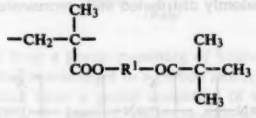
Division of Ser. No. 783,398, Mar. 31, 1977, which is a continuation-in-part of Ser. No. 590,635, Jun. 26, 1975, abandoned. This application Sep. 21, 1978, Ser. No. 944,392

Claims priority, application Czechoslovakia, Jun. 27, 1974, 4540-74; Jun. 27, 1974, 4541-74; Jun. 27, 1974, 4542-74

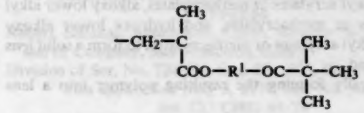
Int. Cl.[2] C08F *22/10, 4/32, 4/34*

U.S. Cl. 526—173 **4 Claims**

1. A method for the preparation of pivaloyloxyalkyl methacrylate polymer containing structural units having the general formula:



which comprises polymerizing a pivaloyloxyalkyl methacrylate having the general formula



where R^1 is $(CH_2)_{n1}$—O or $(CH_2CH_2—O)_{n2}$, n_1 being 2 to 10 and n_2 being 1 to 4,

in the presence of an initiator solution of alkali metal tert-alkoxide at ambient temperature.

4,218,553
POLYMERIZATION OF VINYL CHLORIDE WITH S_xO_y CONTAINING EMULSIFIERS

Hermann Winter; Gerhard Schröter; Wolfgang Jurgeleit, all of Marl; Josef Kalka, Herten, and Bernhard Mihm, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 585,700, Jun. 10, 1975, abandoned. This application Jan. 6, 1978, Ser. No. 867,570

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1974, 2428706

Int. Cl.[2] C08F *2/26;* **C08J** *9/10*

U.S. Cl. 526—209 **5 Claims**

1. In a process for the continuous aqueous emulsion polymerization of vinyl chloride at a pH of 3–9 using a catalytic amount of a water-soluble vinyl chloride polymerization catalyst and an emulsifying amount of an emulsifier to form polyvinylchloride, the improvement which comprises conducting said polymerization in the presence of about 1.6–2.8% by weight, based on the vinyl chloride monomer, of an emulsifier selected from:

(a) 35–65% by weight of an alkyl sulfate of the formula $R—OSO_3Me$ wherein R is alkyl of 10–18 carbon atoms and Me is Na or K; and (b) (i) 65–35% by weight of an alkyl ether sulfate of the formula $R—(OCH_2—CH_2)_n-OSO_3Me$ wherein n is an integer of 1–5 inclusive and R and Me have the above-indicated values; or

(a) 40–60% by weight of an alkyl sulfate of the formula $R\text{-}OSO_3Me$ wherein R is alkyl of 10–18 carbon atoms and Me is Na or K; and (b) (ii) 60–40% by weight of a sodium alkyl sulfonate wherein the alkyl chain is of 10–20 carbon atoms.

4,218,554
PROCESS FOR PREPARING HYDROGEL CONTACT LENSES CONTAINING QUATERNARY AMMONIUM SALTS

William M. Foley, Jr., 2551 Sleepy Hollow Dr., Glendale, Calif. 91206

Filed Oct. 11, 1978, Ser. No. 950,273

Int. Cl.[2] C08F *220/02, 220/06, 220/56, 4/32*

U.S. Cl. 526—264 **1 Claim**

1. A method for making a hydrogel soft contact lens comprising:

(a) co-polymerizing a substantially anhydrous monomer mixture consisting essentially of:

5% to 80% of a group 1 monomer which is a quaternary ammonium salt containing one or more quaternary bounded nitrogens, wherein one of said nitrogens has a polymerizable vinyl group and one or more of said nitrogens has at least one but not more than three hydrophilic substituents, and

1% to 50% of a group 2 monomer which is selected from the group consisting of styrenes, alkyl acrylates or methacrylates, aryl acrylates or methacrylates, and aryl vinyl ethers; and

up to 10% of a group 3 monomer which is a cross-linking agent; and

the balance being a group 4 monomer which is a hydrophilic

molecule selected from the group consisting of hydroxyl lower alkyl acrylates or methacrylates, alkoxy lower alkyl acrylates or methacrylates, and hydroxy lower alkoxy lower alkyl acrylates or methacrylates, to form a solid lens blank; and

(b) mechanically forming the resulting polymer into a lens shape.

4,218,555

PROCESS FOR PREPARATION OF ACETYLENE END-CAPPED POLYIMIDE OLIGOMERS

Patricia A. Antonoplos; Clarence D. Bertino, and William J. Heilman, all of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1978, Ser. No. 956,708
Int. Cl.[2] C08G *73/10, 73/12*
U.S. Cl. 528—126 **15 Claims**

1. A process for preparing an acetylene end-capped polyimide oligomer which consists essentially of:

(a) Preparing a solution containing substantially 1.0 molar equivalent of a dialkyl ester of an aromatic tetracarboxylic acid of structure B in a solvent of the group consisting of lower alkanols containing up to 5 carbon atoms and lower ethers containing up to 6 carbon atoms,

(b) Mixing substantially about 0.5 to 0.8 molar equivalent of an aromatic diamine of structure A with the solution of step (a) to form a reaction product between components A and B; any solvent employed to dissolve B being selected from the group set forth in (a) above, the reaction temperature in step (b) being maintained below about 50° C.,

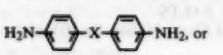
(c) Mixing an aminoarylacetylene of structure C with the solution of step (b) and forming a reaction product thereof, the aminoarylacetylene being added in a quantity sufficient to provide amine groups equivalent to the free carboxylic acid groups present in the product of (b); any solvent employed to dissolve C being selected from the group set forth in (a) above, the reaction temperature in step (c) being maintained below about 50° C.,

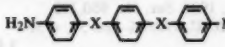
(d) Vaporizing any solvent from the reaction product of step (c), and

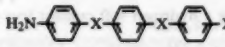
(e) Heating the product of step (d) to a temperature of less than about 210° C. for a period of time sufficient to convert substantially all of the carboxylic acid and ester groups of B moieties and the amine groups of A and C moieties to imide groups; where A has the structure:

(a) $H_2N—Ar—NH_2$,

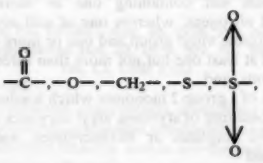
where Ar is a phenyl, or naphthyl group, or

(b) 

(c) 

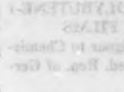
(d) 

where X is

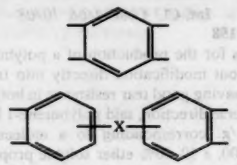


—CF_2—, or a bond,

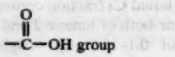
where B has the structure:



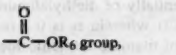
where R_5 has the structure



where X is as defined above, where one of R_1 and R_2 and one of R_3 and R_4 is a



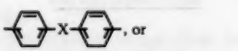
and the other is a

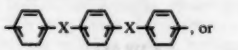


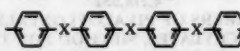
where R_6 is a lower alkyl group containing up to 5 carbon atoms, and where C has the structure:

$H_2N—Arylene—C≡CH$

where Arylene is a phenylene group, a naphthalene group, or

(i) 

(ii) 

(iii) 

and where X is as defined above.

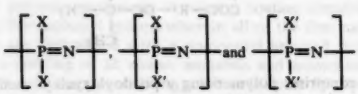
4,218,556

POLYPHOSPHAZENE COPOLYMERS CONTAINING TETRAALKYL ORTHOSILICATE SUBSTITUENTS AND A PROCESS THEREFORE

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,115
Int. Cl.[2] C08G *79/02*
U.S. Cl. 528—168 **6 Claims**

1. A method of preparing polyphosphazene copolymers containing randomly distributed units represented by the formulas:



wherein X is $OSi(OR)_3$ in which R is a branched, straight chain or cyclic alkyl radical containing from 1 to 12 carbon atoms and mixtures thereof, and wherein X' is selected from the group consisting of substituted and unsubstituted alkoxy, aryloxy, amino or mercapto groups and mixtures thereof; said method comprising reacting a poly(dichlorophosphazene) polymer having the formula $—(NPCl_2)_n—$, wherein n is from 20 to 50,000, with a mixture consisting of a tetraalkyl orthosilicate and a substituted or unsubstituted aliphatic or aromatic alcohol, an amino compound or a mercapto compound in the presence of a tertiary amine.

4,218,557

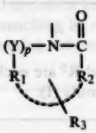
POLYPHOSPHAZENE POLYMERS CONTAINING N-SUBSTITUTED AMIDO AND IMIDO SUBSTITUENTS

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1978, Ser. No. 953,718
Int. Cl.² C08G 83/00, 73/00
U.S. Cl. 528—168 **10 Claims**

1. A polyphosphazene copolymer containing units represented by the formulas:

wherein X is



in which Y is selected from the group consisting of

and $—SO_2—$ and p=0 or 1; when p=0, R_1 and R_2 are independently selected from a group consisting of substituted or unsubstituted aliphatic, aryl, araryl, and alkylaryl radicals or R_1 and R_2 can form a linkage in a cyclic amide containing radical wherein R_1 and R_2 taken together are $-(CH_2)_n-$ where n=2 to 12, wherein R_3 is a lower alkyl radical or hydrogen; and when p=1, R_1 and R_2 taken together form a linkage in a cyclic imide containing radical selected from a group consisting of $-(CH_2)_{n'}-$ where n'=2 to 3 and

R_4 is selected from a group consisting of hydrogen, halogen and alkyl radical containing 1 to 6 carbon atoms; and p' is 0 to 4, X' is selected from a group consisting of substituted or unsubstituted alkoxy, aryloxy, amino or mercapto substituent group or mixtures thereof; $20 \leq (w+y+z) \leq 50{,}000$ per polymer and $(y+z)>0$.

4,218,558

PYRROLIDONE POLYMERIZATION CATALYST SYSTEM

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 724,801, Sep. 20, 1976, Pat. No. 4,101,447. This application May 5, 1978, Ser. No. 903,274
Int. Cl.² C08G 69/24
U.S. Cl. 528—315 **5 Claims**

1. A process for polymerizing 2-pyrrolidone, to form a polymer product capable of being formed into filaments, shape articles or films, which comprises polymerizing 2-pyrrolidone in the presence of a catalyst system consisting essentially of an alkali metal pyrrolidonate, quaternary ammonium carboxylate, and carbon dioxide in a mol ratio of about 1:0.1–2:0.1–0.5.

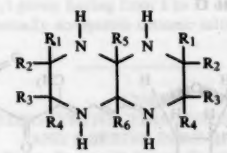
4,218,559

VULCANIZATION SYSTEM FOR VULCANIZABLE THIODIETHANOL ELASTOMERS

Donald R. Maulding, Somerville, and Rudolf A. Behrens, Gladstone, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 5, 1979, Ser. No. 17,656
Int. Cl.² C08G 75/14
U.S. Cl. 528—389 **7 Claims**

1. A vulcanizable elastomer composition comprising a mixture of (A)a vulcanizable elastomer of thiodiethanol, (B) sulfur, and (C) a pyrazine compound, represented by the formula (I):



(I)

wherein R_1 to R_6 are individually, hydrogen or C_1 to C_6 alkyl; or wherein the pair of radicals R_2 and R_3 together with the carbon atoms of the pyrazine ring represent a 6-membered alicyclic ring the remaining substituents being as defined; said valcanizable elastomer of thiodiethanol being a copolymer represented by the formula (II);

$$H—OG—_nOH \quad \text{(II)}$$

wherein —OG— comprises randomly alternating structural units selected from:

(A) structural units (III) and (IV)

$$—OC_2H_4SC_2H_4— \quad \text{(III)}$$

$$—OR— \quad \text{(IV)}$$

and

(B) structural units (III), (IV), and (V)

$$—OR'— \quad \text{(V)}$$

wherein R is one or more radicals remaining on removal of two hydroxyl groups from:

(a) saturated aliphatic linear, branched chain or cyclic diols, or

(b) aliphatic linear, branched chain or cyclic diols containing external unsaturation having an allylic hydrogen atom;

wherein R' is one or more radicals which remain on removal of two hydroxyl groups from a diphenolic compound; said copolymers comprising structural units (A) and (B) being characterized in that:

(1) n is an integer sufficient to provide in said copolymer an average molecular weight of at least 8000;
(2) the molar ratio of (III) to (IV), when said copolymer comprises structural units (A), or the molar ratio of (III) to the total of (IV) and (V) when said copolymer comprises structural units (B), being not less than 1:1; and
(3) containing from about 1 to 10 mole percent of said diol (b), based on the total of all units (III), (IV), and (V) present in said copolymer.

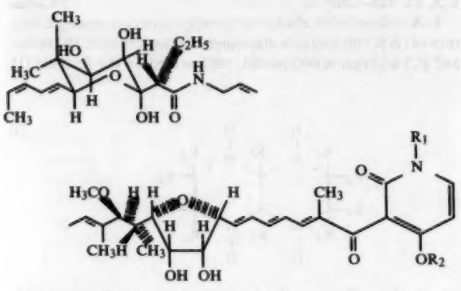
4,218,560

ESTERS OF ANTIBIOTIC X-5108 AND OF MOCIMYCIN

Hubert Maehr, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 844,997, Oct. 25, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,481
Int. Cl.² C07H *7/06*; A61K *31/71*
U.S. Cl. 536—1 **15 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or methyl and R_2 is selected from the group consisting of an acyl moiety of a C_1 to C_7 alkanoic acid, the group

wherein R^{30} is selected from the group consisting of benzoyl, napthoyl and 3,4,5-trimethoxybenzyl and a compound of the formula $-SO_2X$ wherein X is selected from the group consisting of a C_1 to C_7 branched or straight chain alkyl, phenyl and tolyl.

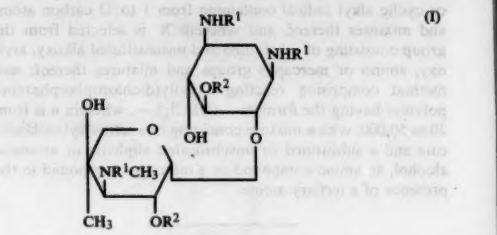
4,218,561

PROCESS FOR THE PREPARATION OF GARAMINE AND GARAMINE DERIVATIVES

Hans Paulsen; Peter Stadler, and Polkhard Iödter, all of Hamburg, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

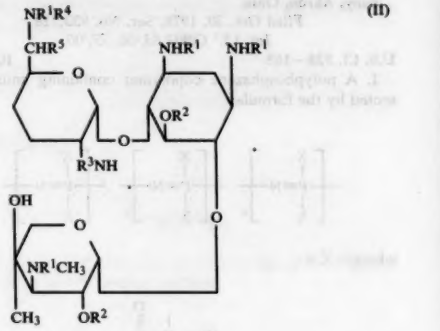
Filed Oct. 20, 1977, Ser. No. 843,918
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647807
Int. Cl.² C07H *15/22*
U.S. Cl. 536—17 R **9 Claims**

1. A process for the preparation of garamine and garamine derivatives of the formula (I)



(I)

wherein the radical R^1 are each H or amino-protecting groups and the radicals R^2 are each H or hydroxyl-protecting groups, which comprises selectively cleaving in a strong acid a compound of formula (II) or a mixture thereof



(II)

wherein R^3 is acyl, R^4 and R^5 are each H or CH_3 and R^1 and R^2 are the same as in formula (I).

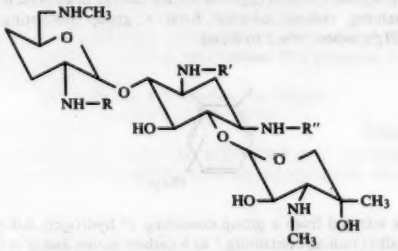
4,218,562

ANTIBIOTIC DERIVATIVES OF XK-62-2

Kunikatsu Shirahata, Columbus, Ohio; Shinji Tomioka, Machida, Japan; Takashi Nara, Tokyo, Japan; Hideo Matsushima, Kawasaki, Japan, and Issao Matsubara, Machida, Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 692,333, Jun. 3, 1976, Pat. No. 4,109,077, which is a continuation of Ser. No. 531,768, Dec. 11, 1974, abandoned. This application Mar. 15, 1978, Ser. No. 886,803
Int. Cl.² A61K *31/71*; C07H *15/22*
U.S. Cl. 536—17 R **5 Claims**

1. A compound having the formula



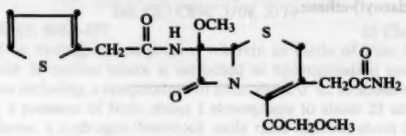
wherein R' is hydrogen and one of R and R" is hydrogen and the other is α-hydroxy-γ-aminobutyryl; or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,218,563
PROCESS FOR THE PREPARATION OF CEPHAMYCIN ANTIBIOTICS

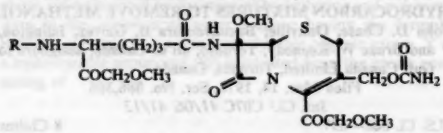
George M. Love, Mountainside; Paul Sohar, Warren, and Leonard M. Weinstock, Belle Mead, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 30, 1979, Ser. No. 25,293
Int. Cl.[2] C07D *501/06*
U.S. Cl. 544—21 4 Claims

1. In the process of preparing the compound



by reacting thienylacetyl chloride with



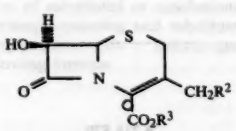
wherein R is p-tosyl in an inert solvent such as methylene chloride at a temperature of between 50°–90° C., the improvement comprising carrying out the reaction in the presence of about 0.8 to 1.5 equivalents of trimethylsilyl loweralkyl carbamate for a time sufficient to reduce the intermediate imide level to less than 5%, then quenching by cooling to between 20° C. and −10° C., and recovering the product thereby produced.

4,218,564
7β-HYDROXY-3-HETEROCYCLICTHIO-METHYL CEPHALOSPORIN INTERMEDIATES

John G. Gleason, Delran, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 588,096, Jun. 18, 1975, Pat. No. 4,020,057. This application Dec. 1, 1976, Ser. No. 746,356
Int. Cl.[2] C07D *501/00*
U.S. Cl. 544—26 7 Claims

1. A compound of the formula:



in which:

R^2 is SHet where Het is selected from the group consisting of 1,2,3-triazolyl, 1,2,4-triazolyl, tetrazolyl, oxazolyl, thiazolyl, 1,3,4-oxadiazolyl, 1,3,4-thiadiazolyl, 1,2,4-thiadiazolyl, pyridyl, pyrimidyl and pyrazinyl, each such ring being attached to S through a carbon ring member, each such ring being unsubstituted or substituted with from one to two groups selected from lower alkyl, alkoxyalkyl and trifluoromethyl, each alkyl or alkoxy group having from one to four carbon atoms; and

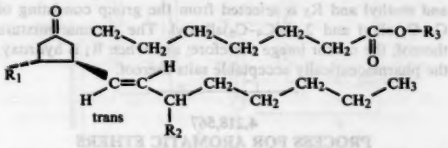
R^3 is hydrogen or an easily removable ester protecting group, or a non-toxic pharmaceutically acceptable salt thereof.

4,218,565
NOVEL 11-DEOXY-11-SUBSTITUTED PROSTAGLANDINS OF THE E AND F SERIES

Charles V. Grudzinskas, Garnerville, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 552,403, Feb. 24, 1975, Pat. No. 4,057,571, Continuation-in-part of Ser. No. 274,559, Jul. 24, 1972, Pat. No. 4,141,914. This application Mar. 10, 1977, Ser. No. 776,445
The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 6 Claims

1. A compound selected from the group consisting of an optically active compound of the formula:



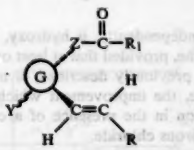
and the racemic mixture of that compound and its mirror image, wherein R_1 is a lower alkyl group; R_2 is selected from the group consisting of hydroxy, lower alkanoyloxy, lower alkylsulfonyloxy, tetrahydropyranyloxy, and tri-(lower alkyl)-silyloxy; R_3 is selected from the group consisting of hydrogen and an alkyl group having from 1 to 12 carbon atoms; and the pharmaceutically acceptable cationic salts thereof when R_3 is hydrogen.

4,218,566
11-(2-HYDROXYETHYLTHIO) PROSTENOIC ACID E AND F SERIES DERIVATIVES

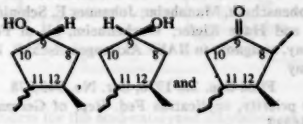
Martin J. Weiss, Bergen, N.J., and Gerald J. Siuta, Westchester, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 782,852, Mar. 30, 1977, abandoned, and a continuation-in-part of Ser. No. 782,853, Mar. 30, 1977, Pat. No. 4,085,272. This application Jan. 30, 1978, Ser. No. 872,662
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 55 Claims

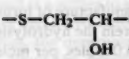
1. An optically active compound of the formula:



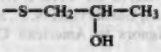
where G is a moiety selected from the group consisting of:



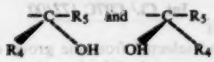
wherein Z is $-(CH_2)_6-$;



or



R_1 is selected from the group consisting of hydroxy and C_1–C_6 alkoxy; and R is a moiety selected from the group consisting of:



wherein R_4 is selected from the group consisting of hydrogen and methyl and R_5 is selected from the group consisting of C_4–C_7 alkyl and 2-cis(C_4–C_6)alkenyl. The racemic mixture thereof; the mirror image therefore; and when R_1 is hydroxy, the pharmaceutically acceptable salts thereof.

4,218,567

PROCESS FOR AROMATIC ETHERS

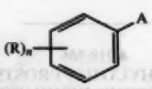
Percy S. Manchand, and John M. Townsend, both of Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 30, 1978, Ser. No. 910,549

Int. Cl.² C07C *69/76*

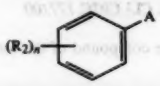
U.S. Cl. 562—475 **6 Claims**

1. In a process for preparing a compound characterized by the formula



I

wherein A is —CHO or —$COOR_3$ or lower alkyl, wherein R_3 is H or lower alkyl; R, independently, is hydroxy, lower alkoxy or lower alkyl, and n is an integer from 1 to 5, provided that at least one R is lower alkoxy, wherein a compound of the formula



II

wherein R_2, independently, is hydroxy, lower alkoxy. lower alkyl or bromine, provided that at least one R_2 is bromo, and n and A are as previously described, is treated with an alkali metal alkoxide, the improvement which comprises carrying out the reaction in the presence of a catalytically effective amount of cuprous chloride.

4,218,568

PREPARATION OF FORMIC ACID

Heinz Hohenschutz, Mannheim; Johannes E. Schmidt, Ludwigshafen, and Hans Kiefer, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

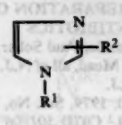
Filed Sep. 26, 1978, Ser. No. 945,878

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744313

Int. Cl.² C07C *51/09*

U.S. Cl. 562—609 **2 Claims**

1. A process for the manufacture of formic acid by hydrolyzing methyl formate, wherein the hydrolysis is carried out in the presence of from 0.5 to 3.0 moles, per mole of methyl formate, of a base of the formula I



I,

where R^1 is a hydrocarbon radical of 1 to 12 carbon atoms and R^2 is hydrogen or one of the radicals R^1, the number of carbon atoms in R^1 and R^2 together being from 4 to 12 or 1,2-di(1-imidazoyl)-ethane.

4,218,569

METHOD FOR PROCESSING ETHERIFIED LIGHT HYDROCARBON MIXTURES TO REMOVE METHANOL

John D. Chase, Oakville; Buenaventura B. Galvez, Islington, and Bruce W. Kennedy, Toronto, all of Canada, assignors to Gulf Canada Limited, Toronto, Canada

Filed Mar. 14, 1978, Ser. No. 886,366

Int. Cl.² C07C *41/06, 41/12*

U.S. Cl. 568—697 **8 Claims**

1. A method for processing an olefinic mixed hydrocarbon stream containing predominantly hydrocarbons of only four carbon atoms each including n-butane and isobutylene, said method comprising:

(i) passing the stream in admixture with methanol in contact with an etherification catalyst, in a reactor under etherifying conditions, to etherify tertiary olefins in the stream,

(ii) passing the resulting ether and mixed hydrocarbon containing effluent to a fractional distillation column and distilling to provide (a) a substantially ether-free distillate containing a proportion of methanol distilling azeotropically with n-butane in the distillate and (b) a distillation residue containing substantially all of the ether from the effluent,

(iii) passing said distillate through a methanol removal unit in contact with a stream of methanol miscible liquid which is ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, or a mixture of any of these to remove methanol from the distillate, and

(iv) separating distillate of reduced methanol content from said liquid.

4,218,570

METHOD FOR PURIFICATION OF ORGANIC REACTION PRODUCTS

Richard V. Norton, Dublin, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 21, 1979, Ser. No. 13,096

Int. Cl.² C07C *13/28*

U.S. Cl. 585—23 **6 Claims**

1. In a method for removing catalyst values from a liquid organic reaction product in which said catalyst consists essentially of an organic soluble iron-ligand complex; the improvement comprising contacting said organic reaction product with a Lewis acid in the form of a halide salt of a metal selected from the group consisting of aluminum, boron, zinc and tin, to effect precipitation of said complex.

4,218,571

OLEFIN HYDROGENATION OVER SYNTHETIC AMORPHOUS SILICA

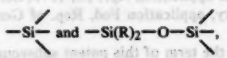
Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 876,813, Feb. 10, 1978, Pat. No. 4,174,356, which is a continuation-in-part of Ser. No. 738,789, Nov. 4, 1976, Pat. No. 4,086,261, which is a continuation-in-part of Ser. No. 638,405, Dec. 8, 1975, Pat. No. 4,003,825, which is a division of Ser. No. 450,967, Mar. 14, 1974, Pat. No. 3,983,055. This application May 21, 1979, Ser. No. 41,204

Int. Cl.[2] C07C *5/04, 5/14*

U.S. Cl. 585—277 22 Claims

1. A hydrogenation process wherein an olefin of from 2 to about 30 carbon atoms is subjected to hydrogenation conditions including a temperature of from about 0° C. to about 400° C., a pressure of from about 1 atmosphere to about 25 atmospheres, a hydrogen/feedstock mole ratio of from about 2 to about 100, and a liquid hour space velocity (LHSV) of from about 0.1 $hr.^{-1}$ to about 100 $hr.^{-1}$, contacting a catalytic amount of a solid containing, at least in part, a synthetic amorphous solid prepared by the steps of hydrolyzing and polymerizing in the presence of water a silane having the formula $R(Si)X_3$, wherein R is a non-hydrolyzable organic group, X is a hydrolyzable group and (Si) is selected from the group consisting of



and calcining the polymerized product, said silane being admixed with a second compound, R'_nMY_m, wherein R' is selected from the group consisting of the same groups as R, Y is selected from the group consisting of the same groups as X and oxygen, M is at least one member selected from the group consisting of the elements of Groups IIIA, IVA, VA, IVB, VB, VIB and VIII of the Periodic Table, m is any number greater than 0 and up to 8 and n is from 0 to any number less than 8.

4,218,572

PROCESS FOR THE PRODUCTION OF POLYPHENYLS

Serge R. Dolhyj, Parma, and Louis J. Velenyi, Lyndhurst, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Sep. 28, 1978, Ser. No. 946,696

Int. Cl.[2] C07C *5/38, 15/14;* B01J *23/22*

U.S. Cl. 585—400 21 Claims

1. A process for producing a polyphenyl by the catalytic dehydrogenation of substituted or unsubstituted cyclohexylbenzene comprising contacting said substituted or unsubstituted cyclohexylbenzene with a dehydrogenation catalyst having the following formula:

$$A_aB_bO_x$$

wherein

A is either one or more elements selected from Group VB or one or more elements selected from Group VB and one or more elements selected from Group VIII;

B is one or more elements selected from the group consisting of Group IA, Group IB, Group IIB, Group VIIB and Group VIB or mixtures thereof; and

wherein

a is 0.1 to 10;

b is 0 to 10; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present;

with the proviso that when the catalyst does not contain a Group VIII element then b must be greater than 0.

4,218,573

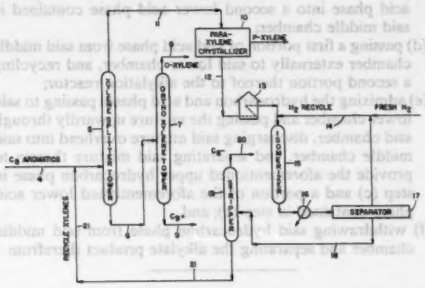
XYLENE ISOMERIZATION

Samuel A. Tabak, Wenonah, and Roger A. Morrison, Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 914,645, Jun. 12, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,824

Int. Cl.[2] C07C *15/00, 15/02*

U.S. Cl. 585—481 13 Claims



1. In a process for isomerizing the xylene content of a charge mixture of eight carbon atom aromatic hydrocarbon compounds which mixture contains xylene and ethylbenzene by contact at conversion conditions with a catalyst comprising a zeolite having a silica/alumina ratio greater than 12 and a constraint index of 1 to 12, the improvement resulting in conversion of ethylbenzene to benzene which comprises using as said catalyst a zeolite containing a substantial proportion of alkali metal sufficient to substantially reduce activity of said zeolite for catalysis of disproportionation reactions and maintaining a conversion temperature of about 800° F. to about 1000° F., said reduced activity being such that less than 2 weight per cent of xylene is lost by contacting xylene with said reduced activity catalyst at 900° F., 200 psig and liquid hourly space velocity of 5.

4,218,574

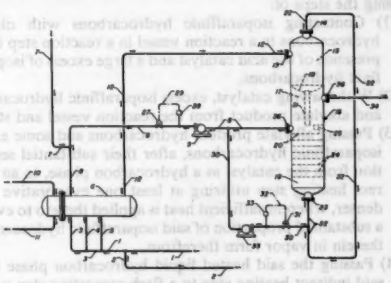
HYDROFLUORIC ACID ALKYLATION UTILIZING A UNITARY SETTLER-SOAKER VESSEL

Robert F. Anderson, La Grange, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 12, 1979, Ser. No. 56,762

Int. Cl.[2] C07C *3/54*

U.S. Cl. 585—719 11 Claims



1. In a process for the acid-catalyzed alkylation of an isoparaffin with an olefin-acting alkylating agent wherein the alkylation reactor effluent is treated in a soaker to complete the alkylation reaction, and in a settler to separate an acid phase for recycle to said reactor and a hydrocarbon phase for the recovery of alkylate product, the improvement which comprises:

(a) charging said alkylation reaction mixture to an upper

settling chamber of a unitary soaker-settler vessel comprising said upper settling chamber, a middle settling chamber and a lower soaking chamber, and forming an upper hydrocarbon phase and a first lower acid phase in said upper settling chamber;

(b) passing said hydrocarbon phase externally from said upper chamber to said lower chamber;

(c) passing said acid phase from said upper chamber through a downspout extending through an upper hydrocarbon phase contained in said middle chamber to discharge said acid phase into a second lower acid phase contained in said middle chamber;

(d) passing a first portion of said acid phase from said middle chamber externally to said lower chamber, and recycling a second portion thereof to the alkylation reactor;

(e) admixing the hydrocarbon and acid phases passing to said lower chamber and passing the mixture upwardly through said chamber, discharging said mixture overhead into said middle chamber, and separating said mixture therein to provide the aforementioned upper hydrocarbon phase in step (c) and a portion of the aforementioned lower acid phase contained in step (c); and,

(f) withdrawing said hydrocarbon phase from said middle chamber and separating the alkylate product therefrom.

4,218,575

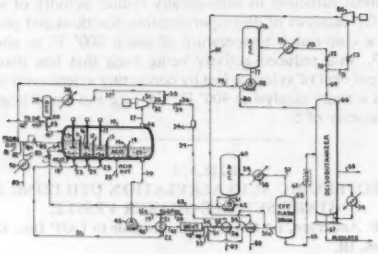
ALKYLATION EFFLUENT FLASH VAPORIZATION WITH HEAT RECOVERY

Orlando Webb, Jr., Lee's Summit, Mo., assignor to Stratford/-Graham Engineering Corporation, Kansas City, Mo.

Filed Apr. 10, 1978, Ser. No. 894,996

Int. Cl.[2] C07C 3/54

U.S. Cl. 585—715 **27 Claims**



1. A process of alkylating isoparaffinic hydrocarbons with olefinic hydrocarbons in the presence of an acid catalyst comprising the steps of:

(1) Contacting isoparaffinic hydrocarbons with olefinic hydrocarbons in a reaction vessel in a reaction step in the presence of the acid catalyst and a large excess of isoparaffinic hydrocarbons,

(2) Withdrawing catalyst, excess isoparaffinic hydrocarbons and alkylate product from the reaction vessel and step,

(3) Passing alkylate product hydrocarbons and some excess isoparaffinic hydrocarbons, after their substantial separation from the catalyst as a hydrocarbon phase, to an indirect heating step utilizing at least one evaporative condenser, wherein sufficient heat is applied thereto to evolve a substantial proportion of said isoparaffinic hydrocarbons therein in vapor form therefrom,

(4) Passing the said heated liquid hydrocarbon phase from said indirect heating step to a flash separating step where said isoparaffinic hydrocarbons are separated overhead therefrom,

(5) Passing liquid bottoms from the flash separating step to a fractionation step where additional heat is applied thereto to evolve further isoparaffinic hydrocarbons in liquid form therefrom,

(6) Condensing the overhead isoparaffinic hydrocarbon vapors from the flash separzation step and returning same in liquid form to the reaction vessel and reaction step for the purpose of maintaining the large excess of isoparaffinic hydrocarbons therein,

(7) Further recycling some of the isoparaffinic hydrocarbon vapors from the fractionation step to the reaction vessel and step in liquid form for the same purpose,

(8) Compressing volatile vapors normally present in at least one stage of the alkylation reaction system to a temperature substantially above the temperature of the hydrocarbon phase of step (3) before said hydrocarbon phase is heated in the heating step of step (3) and passing said compressed vapors to said indirect heating step (3) for use as a source of heat therein, and

(9) The said volatile vapors, after use as said source of heat, being recycled to some portion of the alkylation reaction system for further use therein.

4,218,576

PROCESS OF SCRUBBING POLYVALENT PHENOLS FROM GAS

Hans-Martin Stönner, Schwalbach, and Paul Wiesner, Oberursel, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

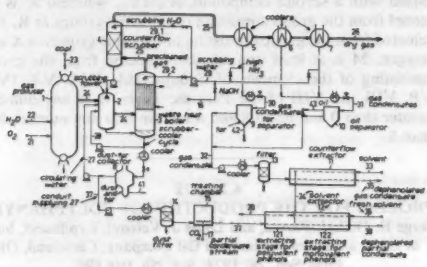
Continuation-in-part of Ser. No. 486,998, Jul. 10, 1974, Pat. No. 4,097,539. This application Apr. 30, 1976, Ser. No. 682,035

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1973, 2365064

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] C07C 37/34

U.S. Cl. 568—751 **7 Claims**



1. A process for the recovery of phenols in admixture with an extraction solvent which comprises the steps of:

(a) deriving from the pressure gasification of coal and gas containing in addition to monovalent a polyvalent phenols, ammonia, carbon dioxide, hydrogen sulfide, ammonia salts with chlorine and fluorine, fatty acids, dust, tars and oils as impurities;

(b) scrubbing the gas derived in step (a) with water to produce a scrubbing aqueous mixture containing some of said impurities and some of said phenols, thereby producing a precleaned gas;

(c) cooling the precleaned gas to remove impurities therefrom;

(d) condensing a phenolic fraction from the cooled precleaned gas and removing tar and oil from the resulting condensate, said condensate constituting an aqueous mixture relatively rich in monovalent phenols;

(e) extracting said aqueous mixture relatively rich in monovalent phenols with the extraction solvent to extract said monovalent phenols and form a further solvent consisting of monovalent phenols and said extraction solvent;

(f) extracting the scrubbing aqueous mixture separately from

the aqueous mixture relatively rich in monovalent phenols with the further solvent produced in step (e) to extract the polyvalent phenols in said further solvent and leaving monovalent phenols in said scrubbing aqueous mixture; and

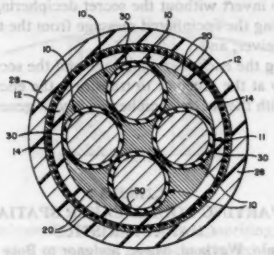
(g) extracting monovalent phenols with fresh extraction solvent from said scrubbing aqueous mixture after step (f) and combining the resulting mixture of extraction solvent and monovalent phenols with the further solvent used in step (f).

4,218,577

TELEPHONE SERVICE WIRE WITH ESTER-BASED FILLING COMPOUND

George Bahder, Edison, and Paul F. Thompson, Millington, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Jul. 20, 1979, Ser. No. 59,325
Int. Cl.[2] H01B 7/28
U.S. Cl. 174—23 C 11 Claims



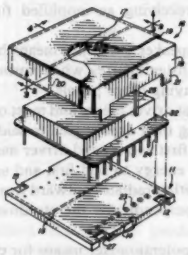
1. A telephone service cable including a plurality of insulated electrical conductors, a plastic jacket surrounding the plurailty of conductors, and a filling compound within the jacket and in contact with the insulated electrical conductors, said filling compound being adhesive within a range from about 70° C. to about −40° C. so as to adhere to the insulated conductors and to itself, said filling compound containing 100 parts of ester-type plasticizer, about 5 to 20 parts of wax having a melting point of about 70 to 150° C., and about 1 to 25 parts of polyethylene.

4,218,578

RF SHIELD FOR AN ELECTRONIC COMPONENT

Wilfred W. Olschewski, and Robert M. Stitt, both of Tucson, Ariz., assignors to Burr-Brown Research Corp., Tucson, Ariz.

Filed Aug. 4, 1978, Ser. No. 931,145
Int. Cl.[2] H05K 9/00
U.S. Cl. 174—35 R 9 Claims



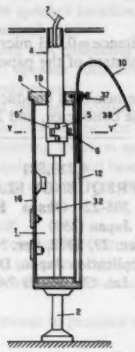
1. An RF shield for an electronic device comprising, in combination, a base support member having first and second conductive sheets secured in spaced relationship to each other by encapsulation in dielectric material thereby defining a gap therebetween, a cover having first and second metal portions secured in spaced relationship to each other by encapsulation in dielectric material thereby defining a gap therebetween, and means for connecting said sheets and said metal portions together to define a D.C. isolated RF shield enclosure for said electronic device.

4,218,579

ELECTRICITY DISTRIBUTION COLUMN

Jean Joly, Houilles, France, assignor to La Telemecanique Electrique, France

Filed Mar. 29, 1978, Ser. No. 891,371
Claims priority, application France, Mar. 31, 1977, 77 09671
Int. Cl.[2] H02G 3/04
U.S. Cl. 174—48 4 Claims



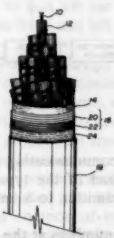
1. In combination, an electrical and communication distribution-column, a ceiling structure having a hole and a floor structure, wherein the column comprises an outer tubular body, stand means siting the said body at predetermined height above the floor structure, a tubular inner body and clamping means for slidably mounting said inner body within said outer body and holding said inner body in relation to said outer body, in an adjustable position in which the top of said inner body projects from the outer body and cooperates with the said hole, the outer body having a U-shaped section comprising two branches respectively terminated by facing grooves running from a bottom portion which shuts off the said outer body at the lower end thereof, point units being arranged on the inner surface of the outer body and electrical conductors passing through the said hole, within the said inner body and being connected to the said point units, and a flexible cover plate inserted into said grooves.

4,218,580

PAPER PULP INSULATED CABLE AND METHOD OF MANUFACTURE

Thomas C. Pound, Kingston, and Eric J. Gouldson, Shawbridge, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 672,366, Mar. 31, 1976, Pat. No. 4,113,534.
This application May 31, 1978, Ser. No. 911,135
Int. Cl.[2] H01B 7/28, 3/52, 11/02
U.S. Cl. 174—107 21 Claims



1. A paper insulated cable comprising a plurality of conduc-

tors each surrounded by paper pulp insulation, pairs of said conductors being twisted together, and groups of said pairs being stranded together, and outer sheathing and jacket, said conductors of the pairs exhibiting a capacitance of

$$C = \frac{0.194\,\epsilon_{ins}}{\text{Log}_{10}\left(\frac{2s}{d}\right) - 0.14}$$

where

C=mutual capacitance=0.083 microfarads/mile

ϵ_{ins}=dielectric constant of the paper pulp insulation =1.47 to 1.69

s=diameter of the insulated conductor

d=diameter of the conductor, and 2s/d=3.2 to 3.4.

4,218,581

HIGH FREQUENCY FLAT CABLE

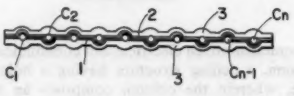
Hirosuke Suzuki, 205-22 Ohaza Kitanaka, Saitama-ken, Tokorozawa City, Japan (359)

Filed Dec. 29, 1978, Ser. No. 974,329

Claims priority, application Japan, Dec. 29, 1977, 52-159236

Int. Cl.² H01B *7/08*

U.S. Cl. 174—117 F **9 Claims**



1. A flat cable for the purpose of transmitting high frequency electromagnetic waves comprising:

(a) a plurality of parallel spaced conductors in a plane;

(b) a plurality of tape segments having a conductive side and an insulative size woven transversely between said conductors at prescribed positions;

(c) an insulation covering said conductors and said tape segments.

4,218,582

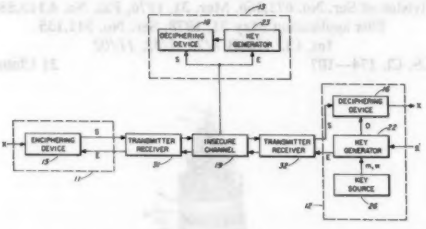
PUBLIC KEY CRYPTOGRAPHIC APPARATUS AND METHOD

Martin E. Hellman, Stanford, and Ralph C. Merkle, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 6, 1977, Ser. No. 839,939

Int. Cl.² H04L *9/04*

U.S. Cl. 178—22 **17 Claims**



1. In a method of communicating securely over an insecure communication channel of the type which communicates a message from a transmitter to a receiver, the improvement characterized by:

providing random numbers at the receiver;

generating from said random numbers a public enciphering key at the receiver;

generating from said random numbers a secret deciphering key at the receiver such that the secret deciphering key is directly related to and computationally infeasible to generate from the public enciphering key;

communicating the public enciphering key from the receiver to the transmitter;

processing the message and the public enciphering key at the transmitter and generating an enciphered message by an enciphering transformation, such that the enciphering transformation is easy to effect but computationally infeasible to invert without the secret deciphering key;

transmitting the enciphered message from the transmitter to the receiver; and

processing the enciphered message and the secret deciphering key at the receiver to transform the enciphered message with the secret deciphering key to generate the message.

4,218,583

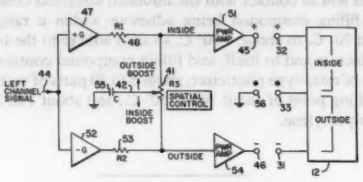
VARYING LOUDSPEAKER SPATIAL CHARACTERISTICS

Louis R. Poulo, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Jul. 28, 1978, Ser. No. 929,179

Int. Cl.² H04R *1/02, 5/00*

U.S. Cl. 179—1 E **17 Claims**



1. Apparatus for controlling the perceived image of a sound signal radiated by a loudspeaker system comprising,

a first set of first and second upper frequency loudspeaker driver means for radiating upper frequency sound energy toward first and second areas respectively beside opposed sides of said first set,

first loudspeaker enclosure means for supporting said first set of loudspeaker driver means having first terminal means coupled to said first set of loudspeaker driver means for receiving an amplified first audio electrical signal,

said first loudspeaker enclosure means having a front panel that faces a listening area when normally positioned in a room and having other panels,

most of said first driver means and most of said second driver means having their axes angled to said front panel so that each of said first and second driver means radiates significantly more energy to said first and second areas respectively than either radiates outward from said front panel in a direction perpendicular thereto directly into the listening area,

image control potentiometer means for controlling the ratio of upper frequency sound energy radiated by said first driver means relative to that radiated by said second driver means to affect said perceived sound image,

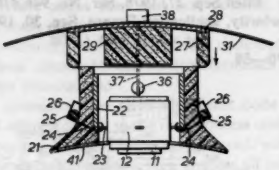
a first input for receiving a first electrical signal representative of a first sound signal emanating from a first direction associated with at least a second sound signal emanating from a second direction different from said first direction, and

means including said image control potentiometer means for coupling said first input to said first terminal means whereby adjustment of said image control potentiometer means affects said perceived image.

4,218,584
STETHOSCOPE FOR USE ON A HORSE

Donald P. Attenburrow, Langford Farm, Newton St. Cyres, Nr. Exeter, Devon, England

Filed Oct. 10, 1978, Ser. No. 950,053
Claims priority, application United Kingdom, Oct. 10, 1977, 42118/77
Int. Cl.[2] A61B 7/04; H04R 1/46
U.S. Cl. 179—1 ST 7 Claims

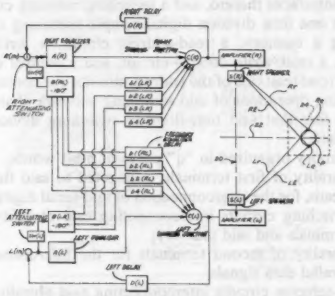


1. A stethoscope for use on a horse, comprising a casing, a transducer in said casing, and a harness adapted for attaching to an animal having a mane, said harness including a strap having a pocket in which said transducer and its casing is held, and including a perforated grid structure attached to said strap, said perforated grid structure adapted for being intertwined with the mane of said horse, the pocket being displaced from the grid structure so that said transducer is held against the windpipe of said horse when said grid structure is intertwined with said mane.

4,218,585
DIMENSIONAL SOUND PRODUCING APPARATUS AND METHOD

Robert W. Carver, P.O. Box 664, Woodinville, Wash. 98072

Filed Apr. 5, 1979, Ser. No. 27,472
Int. Cl.[3] H04S 1/00
U.S. Cl. 179—1 G 86 Claims



1. A dimensionalized audio signal producing apparatus adapted to utilize stereo signals which are characterized in that said signals are non-binaural signals having either a phase shift relationship between corresponding signal components, which phase shift relationship has a time delay distance greater than a time delay distance of a binaural phase shift for an ear spacing distance of a listener, or an amplitude difference greater than binaural amplitude differences of corresponding signal components, and adapted to be used in conjunction with a pair of speakers, where the following conditions exist:

a. there is a playing area,

b. in said playing area there is a forward transmitting area where there are right and left speakers positioned at right and left speaker locations on a base axis and spaced from one another on said base axis by a speaker spacing distance,

c. there is a longitudinal axis positioned equally distant from said speaker locations and perpendicular to said base axis,

d. there is a listening area at the center of which is a listening location positioned on said longitudinal axis rearwardly of said base axis,

e. there is a right listening axis extending from said listening location to said right speaker location at a right listening angle to said longitudinal axis,

f. there is a left listening axis extending from said listening location to said left speaker location at a left listening angle to said longitudinal axis,

g. there are right and left ear locations corresponding to right and left ear positions of a person's head which could be located at said listening location and facing forwardly along said longitudinal axis to said base axis, said right and left ear locations being spaced from one another by an ear spacing distance,

said apparatus comprising:

a. left input means to receive a left stereo signal,

b. right input means to receive a right stereo signal,

c. left signal output means to produce an audio signal for a left speaker,

d. right signal output means to produce an audio signal for a right speaker,

e. left main transmitting means to transmit a left main signal component, corresponding and similar to the left stereo signal, to the left signal output means,

f. right main transmitting means to transmit a right main signal component, corresponding to and similar to the right stereo signal, to the right signal output means,

g. left to right compensating means adapted to receive said left stereo signal to produce an inverted and delayed left to right compensating signal corresponding to said left stereo signal, and to transmit said left to right compensating signal to said right signal output means,

h. right to left compensating means adapted to receive said right stereo signal to produce an inverted and delayed right to left compensating signal corresponding to said right stereo signal, and to transmit said right to left compensating signal to said right signal output means,

i. said two compensating signals each being delayed relative to corresponding main signal components by a time delay period within a predetermined time delay range,

the means of said apparatus being constructed, arranged and related to one another in a manner that said left signal output means produces a left audio signal comprising said left main signal component and said right to left compensating signal, and said right signal output means produces a right audio signal comprising said right main signal component and said left to right compensating signal, so that when said left audio signal drives the left speaker and said right audio signal drives the right speaker, the following occurs

a. there is a left audio output having a main left sound component and a right to left compensating sound component, said left audio output having a primary path component from said left speaker to said left ear location, and a secondary path component from said left speaker to said right ear location,

b. there is a right audio output having a main right sound component and a left to right compensating sound component, said right audio output having a primary path component from said right speaker to said right ear location, and a secondary path component from said right speaker location to said left ear location,

c. the main left sound component reaches the left ear location without being cancelled to a substantial amount,

d. the right main sound component reaches the right ear location without being cancelled to a substantial amount,

e. the main left sound component travelling its secondary path to said right ear location is cancelled to a substantial amount by the left to right compensating sound compo-

nent travelling on the primary path from said right speaker to said right ear location,

f. the main right sound component travelling on the secondary path from said right speaker to said left ear location is cancelled to a substantial amount by the right to left compensating sound component travelling from said left speaker along the left primary path to the left ear location, whereby a person positioned so that the person's head is at the listening location facing along the longitudinal axis toward the transmitting area hears a dimensionalized sound with apparent sound sources being outside of the transmitting area of the two speakers.

4,218,586

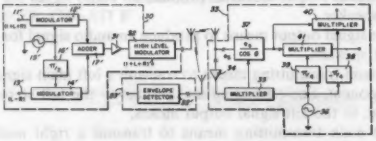
COMPATIBLE AM STEREO BROADCAST SYSTEM

Norman W. Parker, Wheaton, and Francis H. Hilbert, Addison, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 674,703, Apr. 7, 1976, abandoned. This application Jan. 30, 1979, Ser. No. 7,733

Int. Cl.² H04H 5/00

U.S. Cl. 179—1 GS **38 Claims**



5. A system for transmitting and receiving first (A) and second (B) intelligence signals on a single carrier wave, the system including in combination;

transmitter means for providing the carrier wave which is amplitude modulated with a signal proportional to (A+B) and phase modulated with a signal proportional to an angle ϕ having the form

$$\phi = \arctan \{C_1(A-B)/(C_2+A+B)\}$$

where C_1 and C_2 are constants; and

receiver means for receiving the transmitted signal and including means for separately deriving the first (A) and second (B) intelligence signals from the received signal.

4,218,587

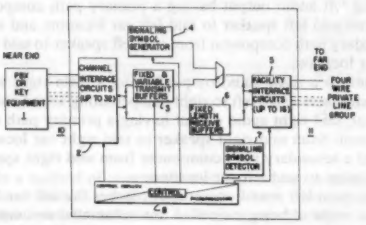
COMPLEX SIGNAL GENERATION AND TRANSMISSION

J. Mark Elder, and Peter G. Ruether, both of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 18, 1978, Ser. No. 943,159

Int. Cl.² H04J 3/12

U.S. Cl. 370—81 **18 Claims**



18. A method of transmitting a complex waveform comprising:

converting said waveform to a digital electrical code the n characters of which represent the n statistically predicted equally likely amplitude ranges of said waveform where n is greater than or equal to three; and

applying said digital electrical signal to a transmission facility.

4,218,588

DIGITAL SIGNAL SWITCHING SYSTEM

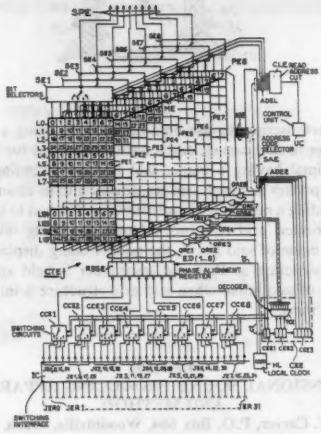
Marc P. G. Dieudonne, Igny, France, assignor to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Sep. 27, 1978, Ser. No. 946,078

Claims priority, application France, Sep. 30, 1977, 77 29440

Int. Cl.² H04Q 11/04

U.S. Cl. 370—59 **2 Claims**



1. Apparatus for switching digital signals arranged in frames, said apparatus having a first access means for the connection of incoming serial digital signal interfaces thereto, a second access means for the connection of outgoing parallel digital signal interfaces thereto, and a switching network comprising at least one time division digital sample switching device including a memory, a read-address circuit, a write-address circuit, a read/write control circuit, and a control unit, connected to at least one of the address circuits, for controlling the switching operations of said switching network characterized by the fact that said time-division switching device further comprises:

a memory organized in "q" pages of n-bit words;

a plurality of first terminals, connected to said first access means, for the interconnection of said serial digital signals;

q switching circuits interconnecting said plurality of first terminals and said memory;

a plurality of second terminals for the interconnection of parallel data signals;

q bit-selector circuits interconnecting said plurality of second terminals and the page data outputs of said memory; and

wherein said at least one time-division switching device is an incoming time-division switching device, the serial signal terminals thereof being connected to said first access means, characterized by:

means for connecting the outputs of said q switching circuits to the data inputs of the q pages of said memory;

means for connecting the outputs of said q bit-selector circuits to said plurality of second terminals, said write-address circuit comprising:

a first counter having a count signal input connected to the output of the local system clock and counter state outputs connected to the control terminals of said q switching circuits and also to the write-address code inputs of the various pages of said memory;

a second counter having a count signal input connected to the overflow output of said first counter, and a plurality of counter state outputs;

means, connected to said second counter, for producing a page-selection code from the plurality of counter state outputs from said second counter; and

a third counter having a count signal input connected to the overflow output of said second counter, and counter state outputs connected to different write-address code inputs of the various pages than said first counter, said read-address circuit comprising:

means for connecting the least significant code output of said read-address circuit to the control terminals of said q bit-selector circuits; and

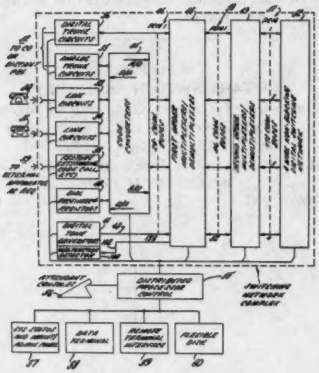
means for connecting the most significant code output of said read-address circuit to the read-address code inputs of the various pages of said memory, said read/write control circuit producing a signal which enables all pages of the memory in the read mode.

4,218,589

METHOD AND APPARATUS FOR TESTING TONE GENERATORS

Satyan G. Pitroda, Villa Park, Ill., and Byung C. Min, Belmont, Calif., assignors to Wescom Switching, Inc., Oak Brook, Ill.

Filed Mar. 28, 1979, Ser. No. 24,544
Int. Cl.[2] H04J *3/12, 3/14*
U.S. Cl. 370—13 **20 Claims**



1. A method of detecting malfunctioning of a digital tone generator in a PCM time multiplex communication system, said system including a network for switching a given tone from a tone generator so that successive digital words of the tone appear in a preselected output channel of successive frames, said method comprising

(a) comparing the successive digital words appearing in a preselected output channel carrying a tone during a plurality of successive frames, and

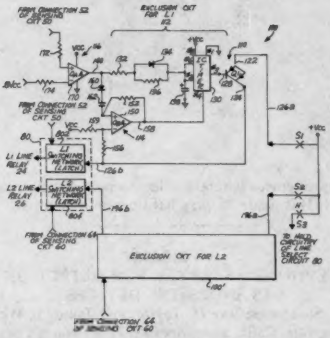
(b) in response to such comparison indicating that all such successive words are alike, producing a stuck-at-dc. signal (SDD).

4,218,590

KEY TELEPHONE SYSTEM HAVING AUTOMATIC EXCLUSION CIRCUIT FOR LINE PRIVACY

Harry R. Rasmussen, Tacoma, and Gene A. Kimzey, Puyallup, both of Wash., assignors to Crest Industries, Inc., Puyallup, Wash.

Filed Jan. 29, 1979, Ser. No. 7,202
Int. Cl.[2] H04M *1/68*
U.S. Cl. 179—99 E **10 Claims**



7. In a key telephone system of the type having a plurality of control units, one for each of a plurality of phone station, for connecting a selected telephone line to a phone set at each such station, and wherein control unit includes a line switching device for connecting the telephone line to the station set, a line condition sensing means for sensing the conditions of on-hook, off-hook and hold on the telephone line, and a latching circuit for said line switching device that responds to a line selector switch and to said condition sensing means to operate and latch said line switching device in a state that connects the line to the station phone set, the improvement of an exclusion circuit in combination with at least one of said control units for providing line privacy, comprising:

a signal controlled circuit means associated with said line selector switch and said latching circuit of the one of said control units, said signal controlled circuit means having a quiescent mode in which said line selector switch is effective, when actuated, to cause said latching circuit means to operate said line switching device, and having an exclusion mode in which said latching circuit means is unresponsive to actuation of said line selector switch; and

control signal means connected to said signal controlled circuit means and to said sensing means of the one of said control units for disposing said signal controlled circuit means in said quiescent mode when said sensing means senses either an on-hook or hold condition on the telephone line, and for disposing said signal controlled circuit means in said exclusion mode when said sensing means senses an off-hook condition on the line.

4,218,591

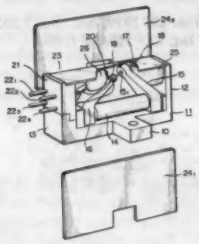
PHONOGRAPH CARTRIDGE WITH VERY HARD METAL CERAMIC FRAME

Tadashi Iwasawa, 5-26-8, Himonyo, Meguro-ku, Tokyo, Japan

Filed Oct. 4, 1978, Ser. No. 948,431
Claims priority, application Japan, Mar. 25, 1978, 53-33625
Int. Cl.[2] H04R *9/12, 11/08*
U.S. Cl. 179—100.41 R **11 Claims**

1. In a pick up cartridge comprising: a frame member (11); an elongated cantilever member (17); a stylus (18) mounted to an end of said elongated cantilever member (17); a pair of yokes (15, 16) mounted in said frame member (11) with a space formed between said yokes; a generating mechanism (19) electrically coupled to said cantilever (17); and said cantilever (17)

being supported between said yokes and said generating mechanism being fixed near a supporting point of said cantilever, said pair of yokes providing a magnetic field to said mechanism;



the improvement wherein at least a part of said frame member (11) is made of very hard ceramic material.

4,218,592

TELEPHONE ANALYZER FOR DETECTION OF CLANDESTINE DEVICES

Arvey Z. Steinbergs; Ray H. Taylor, and James T. Whalen, all of Sunnyvale, Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 14, 1967, Ser. No. 624,115
Int. Cl.[2] H04M *3/26*
U.S. Cl. 179—175.2 D **10 Claims**

1. The method of analyzing the plurality of lines in the mounting cord of a communications instrumentality for determining whether or not certain circuitry is coupled to one or more pairs of said lines, consisting of the steps of

selecting a pair of said lines,

conditioning said pair of lines by illuminating the instrumentality with an acoustical signal such that the coupling of said certain circuitry thereto or absence of such coupling is indicated by the electrical parameters of said pair of lines,

measuring said electrical parameters and indicating the presence or absence of said coupled circuitry, and

selecting a different pair of said lines for such conditioning when said electrical parameters indicate the absence of said coupled circuitry.

4,218,593

LOW RESISTANCE SELECTOR SWITCH

Robert W. Mayer, Hackettstown, and Adam Smorzaniuk, West Millington, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 22, 1978, Ser. No. 908,366
Int. Cl.[2] H01H *19/58*
U.S. Cl. 200—11 TW **20 Claims**

1. A selector switch for selecting any one of a plurality of interconnections among external circuits to be connected to the switch, the interconnections being made in accordance with a predetermined code, said selector switch comprising:

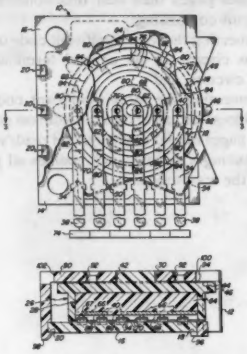
a frame;

a selector mounted for movement relative to the frame to any one of a plurality of fixed relative positions;

the selector including a first part of dielectric material and a second part of electrically conductive material, the selector having a contact face and the second part including a metallic portion having a pattern extending along the contact face of the selector, the pattern being configured in accordance with the predetermined code;

the second part including a portion of non-metallic electrically conductive material beneath the metallic portion, and the metallic portion comprising a plating of metal overlying the non-metallic portion; and

a plurality of electrical contacts affixed to the frame, the contacts having circuit connection portions for connection to the external circuits, and contact surfaces juxtaposed with the contact face of the selector such that movement of the selector relative to the frame to one of said fixed positions will electrically connect and disconnect the contacts in accordance with the pattern of the conductive material at the contact face of the selector to close and open the interconnections among the external circuits;



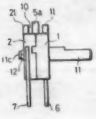
each contact surface being aligned with a path of travel on the contact face of the selector, at least some of the paths of travel including first segments lying along the first part of the selector and second segments lying along the second part of the selector and essentially contiguous with the next adjacent first segment, the elevation of the first segments being the same as the elevation of the second segments at the transition from one to the other of the first and second segments of such paths of travel so as to establish a smooth transition between the first and second parts of each contact surface.

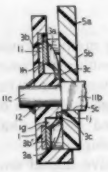
4,218,594

ROTARY SWITCH ASSEMBLY

Hiroki Komatsu, and Tsumoru Oka, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1978, Ser. No. 925,995
Claims priority, application Japan, Jul. 21, 1977, 52-97514[U]
Int. Cl.[2] H01H *19/46*
U.S. Cl. 200—11 G **13 Claims**





1. A switch comprising

a first and second case member each including a recessed base portion having a central opening therethrough, said case members being joined together with the recesses of

said base portions facing one another to form a central space;

each of said case members having a respective plurality of fixed contacts and a single common contact fixed within the recess of its base portion so as to lie around said opening therein, each of said contacts having a terminal portion extending outwardly from the respective case member;

an operation member having a disc member disposed rotatably within said space and a stopper portion extending outwardly through a slot in said joined case members for restricting the rotary movement of said operation member about the axis of said central openings;

a first and second contact member each secured to respective faces of said disc portion and slidable along the contacts within a recess of a respective base portion to enable selective switching between the contacts;

a rotatable shaft member passed through said case members, said first and second contact members and said disc member for rotating said disc member by actuation of the shaft member, said shaft member having an end portion extending outwardly from one of said case members; and

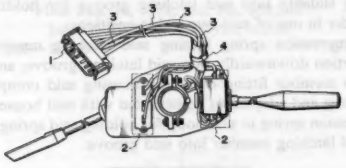
a fastener member attached to said end portion of the shaft member for holding said case members together.

4,218,595

COMPOSITE SWITCH DEVICE MOUNTED TO THE STEERING SHAFT OF AUTOMOBILES

Kazumi Honjo, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Jan. 19, 1978, Ser. No. 870,802
Claims priority, application Japan, Feb. 18, 1977, 52-18582
Int. Cl.² H01H *9/00*
U.S. Cl. 200—61.54 **4 Claims**



1. A composite switch device structurally adapted to be mounted to the steering shaft of an automobile and integrally providing a turn indication switch, a lighting switch, and a wiper and washer switch, comprising:

a switch body on which said switches are mounted;

a terminal supporter connecting to said switch body and defining a plurality of terminal-receiving openings in said terminal supporter;

at least one of said switches being structurally formed to define a rectangular terminal received in one of said terminal receiving openings on said terminal supporter and extending therefrom to receive an electrical coupler, said rectangular terminal provided at one end of a flexible, elongated contact plate of said switch, orthogonal to the remainder of said contact plate and adapted to be connected to said coupler connected to an electric power source; and

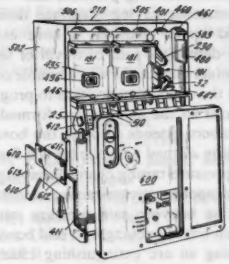
a fixed contact point in said at least one switch, said contact plate being actuatable by a switch-actuating mechanism in said switch body to engage said fixed contact point.

4,218,596

CIRCUIT BREAKER MOLDED HOUSING

Challiss I. Clausing, Marlton, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 16, 1978, Ser. No. 869,589
Int. Cl.² H01H *9/30*
U.S. Cl. 200—144 R **9 Claims**



1. In combination, a unitary housing of insulating material for a high capacity multipole circuit breaker; each pole of said circuit breaker having a stationary contact structure and a first disconnect contact structure connected to said stationary contact structure, a stationary arcing contact structure, an arc extinguishing structure located at and above the stationary arcing contact structure and the stationary contact structure, a second disconnect contact structure and a movable bridging contact connected to said second disconnect contact structure, operating means for moving said movable bridging contact into and out of engagement with said stationary contact structure;

said unitary housing comprising a vertical back wall; said disconnect contact structures of each pole being supported by and extending through said back wall;

a vertical interphase wall perpendicular to said back wall and located between adjacent pole positions for said circuit breaker;

a top wall extending across all the pole positions of said circuit breaker;

vertical side walls at the outer ends of the housing parallel to the vertical interphase walls;

a support at each pole position for said arc extinguishing structure; said top wall and each adjacent pair of walls perpendicular to said back wall defining a recess for receiving said arc extinguishing structure;

said arc extinguishing structure being vented at the top thereof adjacent said top wall;

said top wall having interior guiding surfaces adjacent the top of the arc extinguisher structure directing arc gases toward said pair of walls defining said recess.

4,218,597

GAS-BLAST TYPE CIRCUIT INTERRUPTER

Masami Kii, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,520
Claims priority, application Japan, Mar. 24, 1977, 52/32942; Jun. 27, 1977, 52/76735
Int. Cl.² H01H *33/82*
U.S. Cl. 200—148 R **3 Claims**

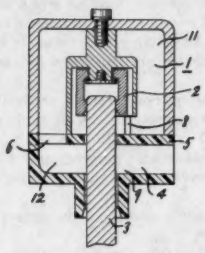
1. A gas-blast type circuit interrupter, comprising:

a pair of separable contact members, at least one of which is movable, said pair of contact members having a contacting position wherein they are touching and no electric arc is formed in use between them, and said pair of contact members being separable to define therebetween a progressively increasing distance with a progressively longer electric arc formed in use therebetween and with the

electric arc axial length dimension extending between the pair of separated contact members;

an upper pressure-raising chamber for containing in use an electronegative gas the pressure of which is raised in use by an electric arc formed between the separated contacts, both of said contact members being positioned within said upper pressure-raising chamber when said contact members are in the contacting position; and

an insulative member having a surface defining a bottom wall of said upper chamber, a bore extending therethrough for defining a path of travel of said at least one movable contact member as said movable contact member moves from the contacting position to progressively separated positions so the electric arc formed between said contact members extends through the bore with the arc axial dimension aligned with the bore, a first cavity defining a lower pressure-raising chamber having an inlet opening into said upper pressure-raising chamber to provide communication between said pressure raising chambers and having an outlet opening into said bore, and a second cavity defining an arc extinguishing chamber having a volume less than that of said lower pressure-raising chamber and an inlet opening into said bore opposite the outlet of said lower pressure-raising chamber and having an



outlet for venting gas therefrom, wherein said bore is dimensioned to closely fit said movable contact member and said movable contact member is dimensioned to extend into said bore and block the outlet of said lower pressure-raising chamber and the inlet of said arc extinguishing chamber for preventing communication between said lower pressure-raising chamber and said arc extinguishing chamber when said contact members are in the contacting position;

whereby separation of said contact members in use to establish an electric arc between said separated contact members is effective to raise the pressure of an electronegative gas within said pressure raising chambers, and progressive separation of said contact members to a distance sufficient to displace said movable contact from blocking the outlet of said lower pressure-raising chamber and the inlet of said arc extinguishing chamber is effective to release electronegative gas at a raised pressure through said bore between the outlet of said lower pressure-raising chamber and the inlet of said arc extinguishing chamber and in a direction perpendicular to the axial dimension of the electric arc extending through said bore for extinguishing the electric arc and venting the electronegative gas through said arc extinguishing chamber.

4,218,598

SWITCH-LATCHING MECHANISM

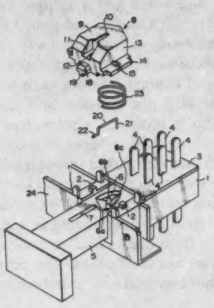
Sadayoshi Iwasaki, and Masso Kumagaya, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 663,263, Mar. 3, 1976, abandoned. This application Apr. 19, 1978, Ser. No. 897,784

Claims priority, application Japan, Mar. 4, 1975, 50/29268

Int. Cl.[2] H01H *13/56*

U.S. Cl. 200—153 J **4 Claims**



1. A switch-latching mechanism comprising:

a body comprised of an electrically insulating material;

a plurality of electrically conductive terminals protruding from said body;

a slider comprised of an electrically insulating material and being retained slidably by said body, said slider having an end portion disposed interiorily of said body and carrying an electrical contact adapted to engage selected ones of said terminals upon sliding movement of said slider into either of two stable positions, said slider further having a generally heartshaped latching groove;

resilient means operatively associated with said slider for biasing it into one of said two stable positions;

an elongate latching member having an end portion projecting slidably into said latching groove for holding said slider in one of said two stable positions;

a compression spring biasing said latching member end portion downwardly into said latching groove; and

a cap member fitting over and housing said compression spring and adapted to be mounted with said housed compression spring to said body for holding said spring to bias said latching member into said groove.

4,218,599

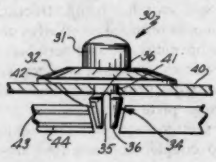
POLYMER SPRING

Larry W. Garn, Sparta, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Nov. 30, 1977, Ser. No. 855,969

Int. Cl.[2] H01H *3/12, 39/00, 15/00*

U.S. Cl. 200—159 R **20 Claims**



1. An electrical contact switching device comprising:

a support board for supporting a switch button;

an aperture in said board;

electrical contacts on one side of said board adjacent said aperture;

an integrally molded polymer contact button including a shank projecting through said aperture, conductive means on said shank adjacent said electrical contacts; said shank having a first end with an adjustment means for reducing the circumference of said first end for passage through said aperture and for increasing the circumference of said first end for resisting removal from said aperture; said shank including an integral head at a second end of said shank, opposite said first end, said head being located on the same side of said support board as said integrally molded flange means whereby said head serves as the point at which pressure is applied to said electrical contact button; and

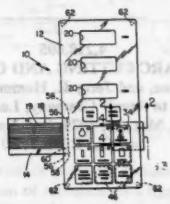
integral resilient flange means of a cupped configuration with the cup opening towards said support board and projecting radially relative to said shank and engaging said support board on the side thereof opposite said electrical contacts; said polymer contact button being molded of a flexible resilient polymeric material so that deflection of said flange means creates a biasing force tending to cause said flange to return to an undeflected state whereby one can close a circuit through said electrical contacts by depressing said polymer contact button and open said circuit by releasing pressure on said polymer contact button; said flange means being attached to the periphery of said head and a portion of said head extending along, spaced from and generally parallel to said shank thereby forming an annular opening between said shank and said portion of said head, and said flange means extending generally radially outwardly from the bottom of said head and at least partially toward said adjustment means so that said flange means can be deflected away from said adjusting means and a biasing force created tending to move said contact button so that said flange is in an undeflected state.

4,218,600

CONNECTING FLEXIBLE SWITCH

William R. Kissner, Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Jun. 26, 1978, Ser. No. 919,386
Int. Cl.² H01H *3/12, 9/26, 43/08*
U.S. Cl. 200—159 B **6 Claims**



1. A flexible switch for mounting on an underlying frame, comprising:

one or more flexible plastic layers, one said layer carrying on one surface a first contact portion and a first conductive lead,

means for spacing said contact-carrying layer from a facing surface carrying a second contact portion aligned with said first contact portion so that said first and second contact portions are electrically isolated in the absence of an external compressive force tending to bring said layer into contact with said facing surface,

a flexible plastic tail integral with one said flexible layer, said tail being bent downward from said layer at a bend region spaced inward from the edge of said switch and said tail carrying on one surface a second conductive lead integral with a conductive lead on said integral layer for electrically connecting said first conductive lead to external circuitry, and

an insert means for occupying at least a portion of the zone from which said tail is bent downward, said zone being that region adjacent to said integral flexible layer occupied by said tail in its unbent condition,

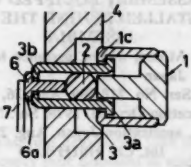
whereby said first contact portion can be electrically connected to external circuitry by means of the electrical path formed by said first and second leads and an uninterrupted peripheral seal can be made between the lower surface of said flexible layer and said underlying frame, with said flexible tail extending through a slot in said frame.

4,218,601

PUSHBUTTON

Motoyuki Saito, Higashiyamato, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1978, Ser. No. 958,661
Claims priority, application Japan, Nov. 16, 1977, 52-136735
Int. Cl.² H01H *3/12;* **G04B** *19/30*
U.S. Cl. 200—159 R **6 Claims**



1. A pushbutton for actuating a switch of an electronic timepiece comprising:

a pipe secured in a hole of a watch case;

a spherical packing of resilient material pressed into said pipe; and

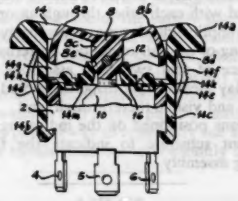
a pushbutton body slidably engaged with said pipe and positioned adjacent said spherical packing, said spherical packing being adapted to be moved by said pushbutton body to actuate a switch provided in the watch case.

4,218,602

SEALED ELECTRIC SWITCH

Herman I. Creech, Smithfield, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 6, 1979, Ser. No. 18,282
Int. Cl.² H01H *9/04*
U.S. Cl. 200—302 **12 Claims**



1. A sealed electric switch comprising:

a switch housing comprising an insulating open-top base and a frame having an actuator opening, said frame connected to said base to close the top thereof except for said actuator opening thereby to provide a contact compartment therewithin;

contact means in said compartment including stationary contacts and movable contact means operable to close and open with respect to said stationary contacts;

terminal means for connecting said stationary contacts to an external circuit;

an actuator and pivot means mounting said actuator to said frame and having a stem extending freely through said opening into said compartment for actuating said movable contact means when said actuator is pivotally operated; and

a seal member for sealing said compartment from the outside comprising:

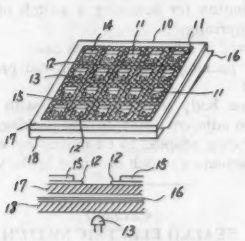
a preformed generally flat resilient member having its rim clamped between said frame and said base and having a hole therethrough and an upwardly and inwardly tapered bushing extending up from the rim of said hole for insertion onto said stem from below to grip at its upper reduced end said stem of said actuator in the area of said pivot means to provide a tight seal; and said stem comprises a convex portion and said upper end of said tapered bushing comprises a complementary concave portion maintaining tight sealing engagement with said convex portion during said pivotal operation of said actuator.

4,218,603

SWITCHING ASSEMBLY EQUIPPED WITH DISPLAY MEANS INSTALLED BEHIND THE SWITCHING ASSEMBLY

Masaharu Satoh, Minou, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 718,209, Aug. 26, 1976, abandoned.
This application Oct. 23, 1978, Ser. No. 953,867
Claims priority, application Japan, Aug. 29, 1975, 50-119527
Int. Cl.[2] H01H *9/16*
U.S. Cl. 200—312 **10 Claims**



1. A switching assembly comprising:

a. a transparent substrate having an indicating surface;

b. a pair of transparent conductive contact patterns formed on a surface of the transparent substrate in a configuration such that the pair of contact patterns may be electrically connected with each other through an operator's finger;

c. an electro-optical display means responsive to the opening and closing of the pair of contact patterns for altering the appearance of said switching assembly when actuated, said display means being disposed behind the transparent substrate and visible therethrough; and

d. label means positioned on the indicating surface of said transparent substrate to indicate the function of the switching assembly.

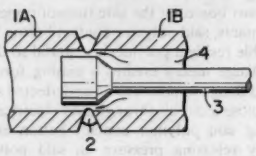
4,218,604

METHOD FOR WELDING OF AUSTENITIC STAINLESS STEEL PIPING

Isao Masaoka, and Katsuyuki Imai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1978, Ser. No. 897,694
Int. Cl.[2] B23K *31/06*
U.S. Cl. 219—61.7 **10 Claims**

1. A method for butt welding austenitic stainless steel piping with forced cooling of the inside by the flow of a cooling liquid, which comprises the steps of initially welding the pipe ends of the austenitic stainless steel piping together by a root pass prior to the inflow of said cooling liquid so as to prevent leakage of said liquid to the outside, introducing an insert for forcibly changing the flow pattern of said cooling liquid into said piping, and welding the junction while forcing said liquid to flow through the space between said insert and the surrounding wall of said piping, wherein said insert is a column, cylinder, or cone having an outside diameter smaller than the inside diameter of said steel piping, and which forms a minimum constrained flow path between itself and the surrounding wall of said piping over a length of at least 25 mm from said welded joint being formed toward the outlet for said cooling liquid, said insert being constructed so that it increases the flow velocity of said cooling liquid to the maximum in the vicinity of the welded joint being formed, whereby the welded joint being formed is cooled to reduce chromium carbide precipitation and tensile residual stresses thereat.



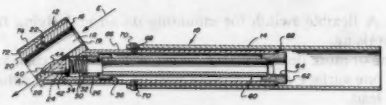
6. A method for butt welding austenitic stainless steel piping with forced cooling of the inside by the flow of a cooling liquid, which comprises the steps of initially welding the pipe ends of the austenitic stainless steel piping together by a root pass prior to the inflow of said cooling liquid so as to prevent leakage of said liquid to the outside, introducing an insert for forcibly changing the flow pattern of said cooling liquid into said piping, and welding the junction while forcing said cooling liquid, by means of said insert, to impinge upon the welded joint being formed, at right angles thereto, and then flow through the constrained flow path formed between said insert and the surrounding wall of said piping over distances of at least 25 mm each upstream and downstream from said joint being formed, said constrained flow path being substantially parallel longitudinally to the surrounding wall of said piping, whereby the welded joint being formed is cooled to reduce chromium carbide precipitation and tensile residual stresses thereat.

4,218,605

AIR-CARBON ARC CUTTING AND GOUGING TORCH

Stephen A. Hoffman, and Jerry R. Hummel, both of Lancaster, Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Mar. 30, 1979, Ser. No. 25,319
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—70 **6 Claims**



1. In a fixed head air-carbon arc cutting and gouging torch having an elongated torch body one end of which receives an electrical cable and an air conduit and the other end has a fixed torch head of the type wherein insertion of an electrode into the torch head is the operative means to move a valve plunger to unseat an air valve to admit air to the torch head for direction along an aerial path defined by the electrode toward the end of said electrode used to produce an arc with a workpiece, the improvement comprising:

said torch head containing a longitudinal bore to receive and

position said electrode relative to said torch body at an angle less than 90°, said bore including a circumferential passage transverse to the longitudinal axis of said bore intermediate the ends of said bore and adapted to be closed by means preventing air passing around an electrode inserted in said head;

an inlet air passage in said head adapted for admitting air to said circumferential passage and for controlling air flow by said plunger valve;

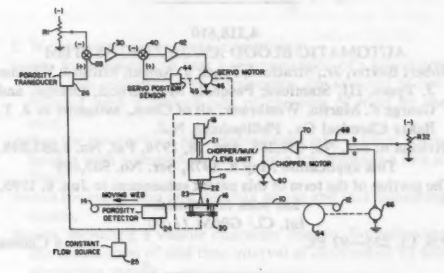
a pair of outlet air passages having longitudinal axis parallel to the longitudinal axis of said bore and said outlet passages extending from said circumferential passage to and opening on a surface of said head adjacent said bore for directing air parallel to said electrode in a direction toward the end of said electrode used to produce the arc each of said passages positioned so that the opening lies on the surface of the head between said bore and said torch body and at an angle no greater than 35° to the centerline of the torch body fixed to the torch head.

4,218,606

APPARATUS FOR PERFORATING WEBS WITH HIGH INTENSITY, COHERENT RADIATION

Hobart A. Whitman, III, Asheville, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Oct. 3, 1978, Ser. No. 948,108
Int. Cl.² H05B 9/00
U.S. Cl. 219—121 L **13 Claims**



1. Apparatus for controlling the porosity of a web of sheet material, comprising:

(a) a source of a beam of coherent radiation and means for focusing said beam of radiation to a fixed focal point;

(b) means for directing said web past said beam;

(c) means for interrupting said beam to produce a plurality of pulses therein, whereby said pulses of coherent radiation produce a corresponding plurality of holes in said web;

(d) electronic means for setting a reference output indicative of the desired porosity of said web;

(e) vacuum chamber and transducer means for measuring the resultant web porosity and for providing a corresponding web porosity output;

(f) an electronic control circuit responsive to the reference output and the web porosity output for providing an error signal indicative of the difference therebetween; and

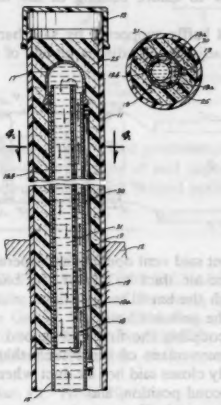
(g) a servomechanism responsive to said error signal for controllably moving said web in a direction parallel to said beam, whereby the size of the resultant web hole and therefore porosity are controlled.

4,218,607

WATER CIRCULATING DEVICE FOR AN ANIMAL WATERING APPARATUS

Wayne B. Noland, 340 Cresent Dr., Carlisle, Iowa 50047

Filed May 8, 1978, Ser. No. 903,568
Int. Cl.² F22H 1/12; A01K 7/06; F16L 53/00
U.S. Cl. 219—301 **1 Claim**



1. In an animal watering device of a type having an exterior housing; a water supply pipe disposed in said housing, a heating element disposed within said housing immediately adjacent to, and in heat exchange relationship with, one side of said water supply pipe for heating the water within said pipe; animal watering means connected to said housing and to said water supply pipe for allowing animals to obtain water therefrom, said supply pipe extending from a point below the frost level of the ground to an above ground point adjacent said animal watering means; thermal insulation means within said housing and surrounding said water supply pipe and said heating element; the improvement comprising:

means for causing circulation of water within said water supply pipe between said points including a circuitous passageway disposed within said water supply pipe, said circulation means including an open ended tubular member disposed within said supply pipe and extending from said first point below the frost line to said second point adjacent said animal watering means, said tubular member including a pair of spaced apart ribs extending externally along the length of said tubular member, said ribs being in sealing contact with the interior of the water supply pipe at said one side thereof to form a passageway between said ribs, the interior surface of the supply pipe immediately adjacent to said heating means and the exterior surface of the tubular member between said ribs whereby water in said passageway will be heated substantially more than the water within said tubular member thereby causing circulation of the water in said supply pipe by causing the hotter water in said passageway to constantly rise and the cooler water in the tubular member to constantly fall.

4,218,608

MULTIPLE DUCT BLOW DRYER AND HAIR STYLER

Michael V. Maroney, P.O. Box 4748, Medford, Oreg. 97501

Filed Aug. 7, 1978, Ser. No. 931,466
Int. Cl.² A45D 20/12; B05B 1/12; F24H 3/04
U.S. Cl. 219—368 **3 Claims**

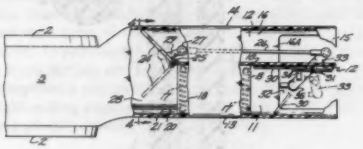
1. In a hand held blow dryer having a fan and motor assembly, a housing defining an air intake, a handgrip portion, switch controls for said fan and motor assembly and for a resistance type electrical heater, the improvement comprising,

blow dryer barrel structure including barrel walls and a

partition defining a hot air duct having said heater therein and a cold air duct, one of said barrel walls defining a vent opening,

a first baffle swingably supported by said barrel structure upstream of said partition, said baffle in a first position closing said cold air duct, said baffle having a second position opening said cold air duct and partially closing said hot air duct to enable bleeding off of a fan discharged airflow to assure cooling of the barrel structure at all times,

a second baffle supported by said barrel structure and located adjacent the discharge end of said hot air duct and



adjacent said vent opening and operable to partially close the hot air duct to divert the barrel cooling airflow through the barrel wall defined vent opening and away from the person's head,

linkage coupling the first and second baffles for synchronized movement of same such that said second baffle partially closes said hot air duct when said first baffle is in said second position, and

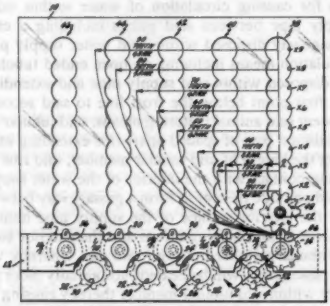
finger actuated baffle control means coupled to one of said baffles enabling the operator to manually control baffle position and thereby determine the temperature of the airflow discharged from the barrel structure.

4,218,609

EDUCATIONAL MECHANICAL CALCULATOR

Yi Chin, 23356 Batey Ave., Harbor City, Calif. 90710

Filed May 1, 1978, Ser. No. 901,704
Int. Cl.[2] G06C *27/00*
U.S. Cl. 235—76 **5 Claims**



1. An educational mechanical calculator for use in teaching arithmetical concepts comprising:

a base;

register gears mounted on said base with their axes perpendicular to a common plane spaced above the base, said register gears spaced sufficiently far part that they do not engage one another, and each bearing marks representing the numerals 0, 1 . . . N, the marks being equally spaced around each of said register gears;

a carry-over gear mechanically unattached to the aforementioned elements, and selectively insertable into and removable from said base by a user;

said base including portions defining carry-over sockets located in such positions relative to said register gears that when said carry-over gear has been selectively inserted into one of said carry-over sockets, it engages two adjacent register gears;

each of said register gears having a first set of teeth which extend perpendicularly from one side of said common plane and a second set of teeth which extend perpendicularly from the opposite side of said common plane;

on successive register gears the first set of teeth and then the second set of teeth alternately consist of a single carry-over tooth, the remaining set of teeth on each register gear having N=1 teeth;

the depths of successive carry-over sockets alternating so that when said carry-over gear is inserted into them in sequence its teeth will alternately engage the first sets of teeth of a first register gear and of an adjacent second register gear and then the second sets of teeth of said register gear and of an adjacent third register gear;

said base further comprising a separate set of multiplying sockets associated with each of said register gears, the centers of successive multiplying sockets within each set being spaced from the center of the register gear with which the set is associated by amounts equal to N+1 times the radius of the associated register gear; and,

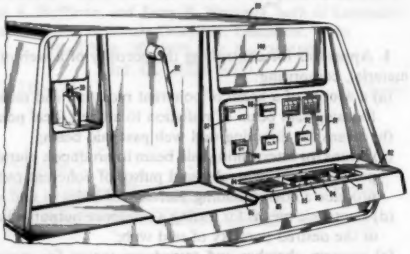
a set of multiplying gears, mechanically unattached to any of the aforementioned elements and to each other, having radii equal to 1, 2 . . . N times the radius of said register gears, having teeth adapted to engage the teeth of said register gears, and having respectively 1, 2 . . . N times the number of teeth as said register wheels, said multiplying gears each bearing marks representing the same set of numerals 0, 1 . . . N as on said register gears, the marks being equally spaced around each of said multiplying gears, each of said multiplying gears individually selectively insertable into and removable from one of said multiplying sockets by a user, and when so inserted engaging a register gear.

4,218,610

AUTOMATIC BLOOD ANALYZING SYSTEM

Robert Baxter, Jr., Stratford; Frank J. Antoci, Milford; William J. Tynes, III, Stamford; Pasquale M. Petrucci, Orange, and George F. Martin, Westbrook, all of Conn., assignors to J. T. Baker Chemical Co., Phillipsburg, N.J.

Division of Ser. No. 681,285, Apr. 28, 1976, Pat. No. 4,093,849.
This application May 8, 1978, Ser. No. 903,689
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.[2] G06M *11/00*
U.S. Cl. 235—92 PC **6 Claims**



1. A method of performing a blood analysis comprising the steps of:

providing electrical pulses representative of blood cells passing through a first fluid path;

detecting a first sample flow corresponding to the flow of a first predetermined volume through said first fluid path and providing a first signal representative thereof;

detecting a second sample flow corresponding to the flow of

a second predetermined volume through the first fluid path and providing a second signal representative thereof;
calculating, in response to said electrical pulses and said first signal, a first count of the number of blood cells in the first predetermined sample volume;
calculating in response to said electrical pulses and said second signal, a second count of the number of blood cells in the second predetermined sample volume;
comparing said first and second counts to determine if the calculated counts are within a predetermined tolerance;
averaging said first and second counts; and
providing an output indication of the average of said first and second counts only when the first and second counts are within the predetermined tolerance.

4,218,611

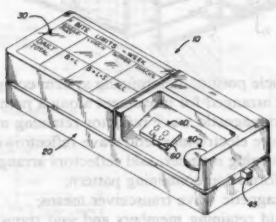
METHOD AND APPARATUS FOR CONTROLLING EATING BEHAVIOR

Thomas G. Cannon, Bellvue, Colo., assignor to Trendmark Corporation, Ft. Collins, Colo.

Division of Ser. No. 712,548, Aug. 9, 1976. This application May 17, 1978, Ser. No. 906,460

Int. Cl.² G06M 3/06; G08B 5/36

U.S. Cl. 235—92 T **19 Claims**



1. Weight control apparatus comprising:
means for yielding to a user a representation of a succession of signals repeating with a frequency pre-selected to correspond with a desired rate of chewing of food by the user;
means for measuring a pre-selected time interval that corresponds with a desired length of time for chewing a bite of food;
means for energizing said yielding means and said measuring means;
means, including a visable character display, for indicating the termination of said time interval as determined by said measuring means;
manually-operable switch means for activating said yielding means and said measuring means;
and means for indicating said termination of said time interval as a steady-state energization of said visible character display.

4,218,612

MAGNETIC SIGNAL DETECTOR

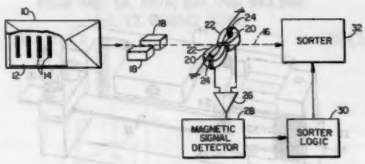
William H. Krehl, Homestead, and John R. DeHart, Coral Gables, both of Fla., assignors to Docutronix, Inc., Homestead, Fla.

Filed Oct. 5, 1978, Ser. No. 948,967

Int. Cl.² G06K 7/08, 19/06; G11B 5/09

U.S. Cl. 235—449 **10 Claims**

1. A circuit for detecting signals from a voltage waveform generated by a pickup for sensing bars of magnetized material appearing on a carrier moved past the pickup and which voltage waveform for each bar moved past the pickup has a base voltage level and includes a first voltage pulse of one polarity relative to said base voltage followed by a second voltage pulse of opposite polarity relative to said base voltage, said circuit having said pickup voltage waveform as an input thereto and comprising a means for producing an output signal indicating the valid detection of a bar of magnetic material only when said voltage waveform undegoes a pulse of said one polarity



having an amplitude greater than a first predetermined value and is immediately followed by a pulse of said opposite polarity having an amplitude greater than a second predetermined value.

4,218,613

AMPLIFIER FOR ELECTRIC SIGNALS

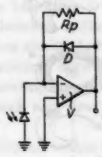
Walter Bletz, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,837

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748647

Int. Cl.² H01J 39/12

U.S. Cl. 250—214 A **10 Claims**



1. An amplifier circuit for electrical signals having A.C. signal components and D.C. signal components produced by means of a photoelectric transducer as a function of intensity of illumination incident upon said transducer, comprising:
an operational amplifier operatively connected in series after said photoelectric transducer and having a feedback branch, said feedback branch including a resistance connected in parallel with an electrical element having a current-nonlinear characteristic, whereby the amplifier circuit has a frequency band with an upper angular frequency which is determined by said resistance and by the capacity of said current-nonlinear electrical element for low light illumination intensities incident upon said transducer.

4,218,614

DEVICE FOR MEASURING VIBRATION AMPLITUDE

Robert C. Miller, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

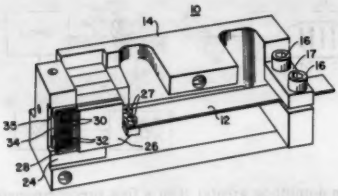
Filed Jun. 8, 1978, Ser. No. 913,774

Int. Cl.² G01D 5/34

U.S. Cl. 250—231 R **11 Claims**

1. In combination, a vibratory member adapted to be excited into vibration, a vane attached to said vibratory member for movement therewith, a light source, a light receiver, said light source and light receiver being positioned for transmission of light from the source to the receiver, the vane including a portion extending into the light path between the source and receiver and said portion having a plurality of elements for directing light to the receiver and light-absorbing elements

alternating with each other and extending transversely of the direction of movement of the vibratory member and uniformly spaced in said direction, a stationary mask covering the light receiver and having at least one light-transmitting element of



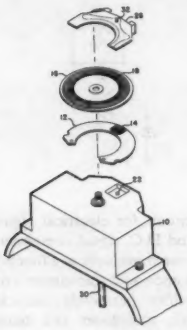
the same size and orientation as the light-directing elements of the vane, and said light-receiving means including counter means for counting the number of occurrences of minimum light transmission to the light-receiving means.

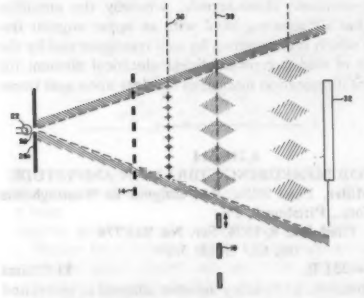
4,218,615

INCREMENTAL DIGITAL SHAFT ENCODER

Werner G. Zinn, Jr., Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Oct. 23, 1978, Ser. No. 953,730
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE **6 Claims**





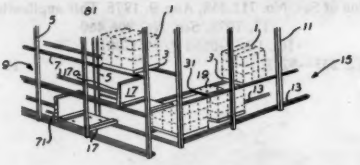
1. An optical incremental shaft encoder comprising a monochromatic light source, an adjacent slit through which light from said source is directed, and an adjacent fixed mask of closely spaced alternate transparent and opaque lines, the diverging light rays from said slit falling on the lines of said fixed mask and thereby forming a diffraction optical system which generates images of said slit at discrete planes spaced from said fixed mask, a movable mask having closely spaced alternate transparent and opaque lines, with the spacing of such lines being such as to match the spacing of the lines of a selected image plane, said movable mask being connected to a device whose motion is to be measured, and being movable in a plane essentially parallel to the selected image plane, and photodetector means placed to sense alternating light and dark resulting from movement of said movable mask.

4,218,616

AUTOMATED WAREHOUSE VEHICLE POSITION DETERMINING SYSTEM

Weston R. Loomer, Walton, Ky., assignor to Litton Systems Inc., Florence, Ky.

Filed Mar. 27, 1978, Ser. No. 890,219
Int. Cl.[2] G08G *1/12*
U.S. Cl. 250—223 R **3 Claims**



1. A vehicle position determining system comprising:
a vehicle arranged for movement along a path;
an electro-magnetic wave reflector retaining member;
one or more electro-magnetic wave reflectors supported by said retaining member, said reflectors arranged in a location information containing pattern;
electro-magnetic wave transceiver means;
one of said retaining members and said transceiver means being coupled to said vehicle and the other being fixedly positioned whereby said transceiver means and said retaining member are arranged for relative movement into and out of alignment with one another, said transceiver means adapted to provide an output signal related to said pattern upon the alignment of said transceiver means and said reflectors;
an activation electro-magnetic wave reflector having a reflector expanse which is less than the reflective expanse of the reflectors arranged in said location information containing pattern supported by said retaining member; and
wherein said electro-magnetic wave transceiver means includes an activation transceiver,
the alignment of said activation transceiver with said activation reflector providing a signal adapted to activate the remainder of said transceiver means whereby said transceiver means is permitted to provide said output signal.

4,218,617

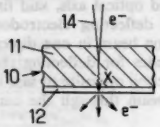
MICRO-ANALYSIS PROCESSES USING X-RAYS

Jacques Cazaux, Reims, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Nov. 27, 1978, Ser. No. 964,031
Claims priority, application France, Nov. 29, 1977, 77 35901
Int. Cl.[2] H01J *39/00*
U.S. Cl. 250—305 **17 Claims**

1. A process of microanalysis using X-rays, comprising the steps of: forming an anticathode consisting of a thin layer of material to be analyzed, scanning said anticathode with a thin beam of primary electrons to form X-rays, receiving said X-rays in a thin layer of a converter substance to generate a current of photoelectrons from absorption of said X-rays in said convertor substance, said converter substance selected to have a photoelectronic spectrum which is simple and to exhibit

one peak having a low bonding energy, collecting the current of photoelectrons, measuring the successive instantaneous



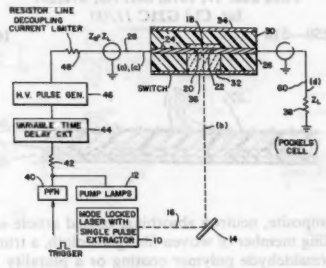
values of said current and determining the properties of the successive zones of the anticathode which receive the beam from said values.

4,218,618

APPARATUS FOR SWITCHING HIGH VOLTAGE PULSES WITH PICOSECOND ACCURACY

Gerard Mourou, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Feb. 21, 1979, Ser. No. 13,642
Int. Cl.³ H01J 40/14
U.S. Cl. 250—211 J **11 Claims**



1. Apparatus for switching high voltage pulses having magnitudes of the order of 10 kV and durations up to about 10 ms in a period of time of the order of picoseconds, which comprises a body of semiconductor material the resistivity of which both decreases several orders of magnitude when illuminated by optical energy of a certain wavelength and also decreases with increasing temperature, means for supporting said body between a pair of electrodes in a path traversed by a beam of said optical energy, the length of said body between said electrodes being L, said length L being such that for a voltage magnitude V_o of said pulses, the change in temperature T, of said body from an initial temperature T_o, the resistivity, p, of said body changes, in the absence of said optical energy illumination, no more than 50% from the resistivity, p_o, thereof at the initial temperature where

$$\frac{dT}{dt} = \frac{V_o^2}{dcL^2p}, \text{ and}$$

$$p = p_o\left(\frac{T}{T_o}\right)\exp\frac{-E_g}{2k}\left(\frac{1}{T}-\frac{1}{T_o}\right),$$

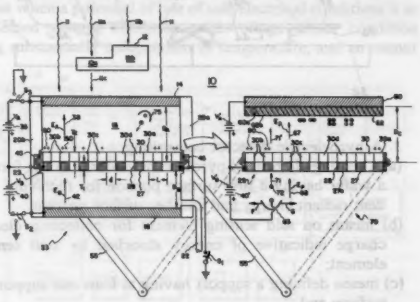
where T is the instantaneous temperature of said body in degrees Kelvin, T_o is the initial temperature in degrees Kelvin, p is the resistivity in ohms per centimeter, p_o is the resistivity in ohms per centimeter at temperature T_o, c is the specific heat of said semiconductor material, L is said length in centimeters, k is the Boltzmann constant, E_g is the band gap energy of said semiconductor material in Joules, and d is the density of said semiconductor material in grams per cubic centimeter.

4,218,619

MULTI-COPY ION-VALVE RADIOGRAPHY

Kei-Hsiung Yang, and Lothar A. Gruenke, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1978, Ser. No. 942,548
Int. Cl.² G03G 15/00
U.S. Cl. 250—315.2 **28 Claims**



1. Apparatus for providing a radiograph of an object differentially absorbing radiation from a radiation source, said apparatus comprising:

an exposure chamber including a first electrode receiving the differentially-absorbed radiation; a second electrode spaced from said first electrode by a preselected distance; means filling the volume between said first and second electrodes for converting the differentially-absorbed radiation passing through said first electrode to electrically charged particles;

a mesh structure positioned within the volume of converting means between said first and second electrodes, said mesh structure including a conductive mesh and a layer of insulative material supported upon the surface of the solid portion of said mesh closest to said first electrode;

first means for providing an electric field between said first and second electrodes to cause at least some of the charged particles converted by said converting means to collect adjacent to the surface of said mesh structure insulative layer furthest from said mesh to form a charge pattern thereon representative of said object;

a development chamber including a third electrode having a surface; a sheet of insulative material supported by said third electrode surface; means spaced from said third electrode surface for projecting a stream of ions toward the insulative sheet; and second means for forming an electric field between said ion projecting means and said third electrode for accelerating said ions towards said insulative sheet;

means for moving said mesh structure from said exposure chamber, after collection of said charge pattern responsive to the differentially-absorbed radiation, to a position in said development chamber and between said third electrode surface and said ion projection means; and

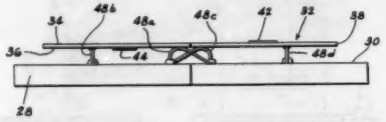
means for coupling at least said conductive mesh and said first and second electrodes to electrical ground potential during movement of said mesh structure;

the flow of said projected ions through said mesh structure to the surface of said insulative sheet being controlled by the charge pattern deposited upon said mesh structure insulative layer to produce a charge pattern upon the surface of said insulative sheet representative of the radiation-absorbing properties of said object.

4,218,620
PYROELECTRIC DETECTOR HAVING IMPROVED SUSPENSION MEANS

Friedrich H. Oettel, Daytona Beach, Fla., assignor to Eltec Instruments, Inc., Daytona Beach, Fla.

Filed Jul. 20, 1978, Ser. No. 925,991
Int. Cl.[2] G01J 1/00; H01S 4/00
U.S. Cl. 250—338 31 Claims

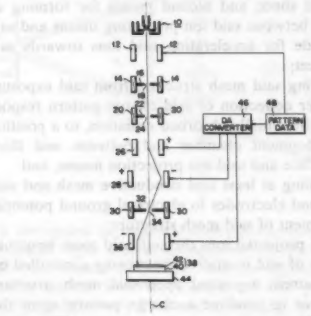


1. A pyroelectric detector comprising:
(a) a sensing element of pyroelectric material in the form of a wafer having a first surface portion for receiving incident radiant energy and another surface portion;
(b) means on said sensing element for collecting electric charge indicative of energy absorbed by said sensing element;
(c) means defining a support having at least one supporting surface; and
(d) flexible suspension means for supporting said sensing element in spaced relation to said supporting surface, said suspension means being connected to said supporting surface and to said other surface portion of said sensing element, said suspension means having sufficient strength to hold said sensing element in spaced relation to said supporting surface and having a degree of flexibility sufficient to absorb shock and vibration forces and to compensate for different coefficients of thermal expansion of said sensing element and said supporting surface, said flexible suspension means having an area of contact with at least one of said supporting surface and said other surface portion of said sensing element, said area of contact being at least several times smaller than said supporting surface or said other surface portion.

4,218,621
ELECTRON BEAM EXPOSURE APPARATUS

Mamoru Nakasuji, and Toshiaki Shinozaki, both of Yokohama, Japan, assignors to Vlsi Technology Research Association, Japan

Filed Jun. 15, 1978, Ser. No. 915,869
Claims priority, application Japan, Jun. 15, 1977, 52/70626; Jun. 15, 1977, 52/70628
Int. Cl.[2] A61K 27/02
U.S. Cl. 250—492 A 13 Claims



1. An electron beam exposure apparatus comprising:
an electron gun to produce an electron beam along an optical axis through said apparatus;
a first deflection system for deflecting said electron beam at an angle to said optical axis, said first deflection system including first deflecting electrodes for deflecting the incident electron beam in one direction and second deflecting electrodes for deflecting the deflected electron beam in a direction opposite to said one direction to pass said electron beam through the center of an objective electron lens;
said objective electron lens receiving and converging the electron beam deflected by said first deflection system and forming a final latent image; and
a second single deflection system next to said objective electron lens for deflecting said converged and deflected electron beam from an angle with the optical axis of said apparatus to parallel with said optical axis and applying said electron beam directly to a workpiece disposed at right angles to said optical axis.

4,218,622
NEUTRON ABSORBING ARTICLE AND METHOD FOR MANUFACTURE THEREOF

Carl H. McMurtry, Youngstown; Robert G. Naum, Lewiston, and Paul F. Forsyth, Niagara Falls, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 17, 1978, Ser. No. 870,237
Int. Cl.[2] G21C 11/00
U.S. Cl. 250—518 16 Claims

1. A composite, neutron absorbing, coated article comprising a backing member of woven fiberglass cloth, a trimethylol phenol formaldehyde polymer coating or a plurality of such coatings on said cloth and boron carbide particles held to said backing member by said coating or plurality of said coatings, which boron carbide particles are partially uncoated by said coating or coatings and project past said coating or coatings in a direction or directions opposite to that or those of the backing member and are of sizes in the No. 60 to 400 sieve range and in which article the B^{10} loading is in the range of 0.001 to 0.1 g./sq. cm.

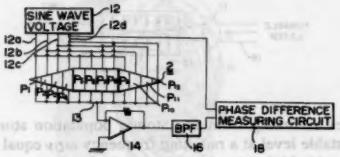
4,218,623
DEVICE FOR DETECTING DISPLACEMENT OF AN OPTICAL IMAGE

Ken Utagawa, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,918
Claims priority, application Japan, Nov. 12, 1977, 52/135228; Dec. 23, 1977, 52/154314; Aug. 24, 1978, 53/102259
Int. Cl.[2] H01J 39/12
U.S. Cl. 250—578 15 Claims

1. A device for detecting displacement of an optical image by an image forming optical system in a direction substantially perpendicular to the optic axis of the image forming optical system, comprising:
(a) an array (2) of photosensitive elements (P) comprising a plurality of photosensitive elements disposed on or near the image plane of said image forming optical system (L);
(b) means (8, 10) for generating an electrical output (I_S) which creates a phase change in response to the displacement of the optical image in the direction of arrangement of said photosensitive elements in accordance with the outputs of the photosensitive elements of said array;
(c) contribution reducing means (4) for reducing the contri-

bution of the outputs (f) of said plurality of photosensitive elements located near the opposite ends of said array to said electrical output; and



(d) detector means (18;40) for detecting displacement of said optical image from the phase information of the electrical output of said electrical output generating means.

4,218,624

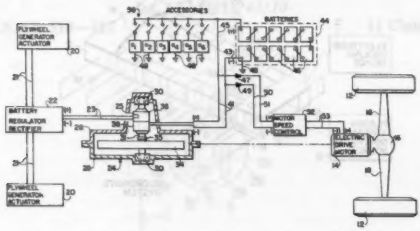
ELECTRICAL VEHICLE AND METHOD

Edward L. Schiavone, 10502 Insley St., Silver Spring, Md. 20902

Filed May 31, 1977, Ser. No. 801,722

Int. Cl.[2] B60L *11/22*

U.S. Cl. 290—45 **2 Claims**



2. The method of utilizing transverse vehicular motion produced by road surface irregularities to charge the batteries of a battery-powered vehicle comprising the steps of

(a) translating the transverse vehicular motion into electrical energy;

(b) applying the electrical energy to drive a motor-generator-flywheel unit mounted on the vehicle, said flywheel providing additional driving force and energy storage means for operating the generator of said motor-generator-flywheel unit;

(c) utilizing the moment of inertia of said flywheel to provide force for driving said generator during periods when transverse vehicular motion is not available to produce electrical energy; and

(d) charging the batteries of said battery-powered vehicle with the output of said generator.

4,218,625

SYNCHRONIZING CHECK RELAY

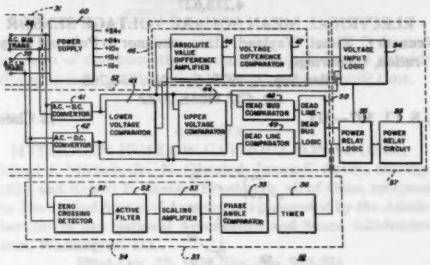
Robert W. Beckwith, 5728 Oakhurst Dr., Seminole, Fla. 33542, and Michael A. Wyatt, 4336 Millbrook Ave., Tampa, Fla. 33611

Filed Jan. 25, 1978, Ser. No. 872,268

Int. Cl.[2] H02J *3/08*

U.S. Cl. 307—87 **36 Claims**

29. In an alternating current electrical transmission system having a pair of lines connected to a circuit breaker, a synchronizing check relay comprising: input means adapted for connection to said pair of lines connected to said circuit breaker, said input means being adapted to detect a first electrical condition on one of said lines and a second electrical condition on another of said lines; a phase sensor connected to said input means, said phase sensor producing a selected phase sensor output when a difference between a phase of said first electrical condition and a phase of said second electrical condition is at a selected phase condition, said selected phase condition being substantially independent of temperature over a range of temperatures; timing means responsive to said selected phase sensor output for generating a timeout signal after a predetermined time interval, a voltage sensor connected to said input means, said voltage sensor producing a selected voltage sensor output when a potential of one of said electrical conditions is at a selected voltage condition, said voltage sensor condition being substantially independent of temperature; and an output



control circuit, said output control circuit being connected to said voltage sensor, said output control circuit also being connected to the circuit breaker, said output control circuit providing a control signal to said circuit breaker when said phase sensor produces said selected phase sensor output and said timing means produces said time-out signal, said voltage sensor including an absolute value sensor, said absolute value sensor producing an absolute value sensor response when a difference between a potential of said first electrical condition and a potential of said second electrical condition exceeds a selected absolute value condition, said selected absolute value condition being substantially independent of temperature over a range of −40° C. to +80° C.

4,218,626

ELECTROMAGNETIC RELAY

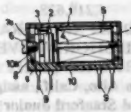
Hiroshi Fukuda, Tokyo, and Minoru Shimoda, Hiratsuka, both of Japan, assignors to Matsu Kyu Kabushiki Kaisha, Higashi-Nihonbashi, Japan

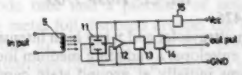
Filed Aug. 2, 1978, Ser. No. 930,752

Claims priority, application Japan, Mar. 15, 1978, 53-32994[U]

Int. Cl.[2] H01H *36/00*

U.S. Cl. 307—116 **3 Claims**





1. An electromagnetic relay comprising: a magnetic circuit having a gap, said magnetic circuit including a yoke having at its opposite ends turned portion extending in parallel spaced relation, a core having its one end attached to one of said

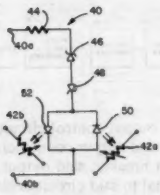
turned portions and the other end facing the other turned portion, and an energizing coil surrounding said core, said energizing coil being energized when an input signal is impressed on the electromagnetic relay, said gap being located between the other turned portion of said yoke and the other end of said core; a magneto-electro converting device in said gap; a permanent magnet disposed in said gap for increasing the magnetic flux density of the magnetic field produced in said gap; and means for adjusting the distance of said gap, thereby making it possible to adjust the magnetic density within the magnetic circuit to obtain a desired output of the electromagnetic relay.

4,218,627

ELECTRICAL MEAN SQUARE VOLTAGE SENSOR

Kenneth C. Kiesel, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 1, 1978, Ser. No. 938,768
Int. Cl.² H03K *3/42*
U.S. Cl. 307—311 **12 Claims**



1. An electrical sensor circuit for producing an electrical output signal parameter corresponding to the mean square of an applied alternating voltage, said sensor comprising:

input terminals for receiving the applied AC voltage;

zener diode means, for receiving the applied alternating voltage and for providing a reverse zener voltage breakdown characteristic less than the maximum amplitude of the applied AC voltage;

light-emitting diode means in series electrical connection with respect to said zener diode means for providing a forward biased conduction path upon the breakdown of said reverse zener diode voltage by the applied alternating voltage; and

inactive photoresponsive resister means optically coupled with respect to said light-emitting diode means for receiving electroluminescence emitted therefrom in response to said current flow through said light-emitting diode means, the resistance of said photoconductor means thereby varying as a function of the mean square of the applied alternating voltage.

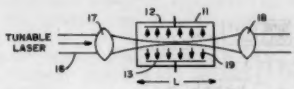
4,218,628

VACUUM ULTRAVIOLET AND X-RAY LIGHT SOURCE AND METHOD AND SHORT WAVELENGTH LASER PUMPED BY SAID LIGHT SOURCE

Stephen E. Harris, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 840,000, Oct. 6, 1977, abandoned. This application May 23, 1979, Ser. No. 41,778
Int. Cl.² H03F *7/00*
U.S. Cl. 307—426 **31 Claims**

1. A vacuum ultraviolet and x-ray high intensity light source comprising an envelope, a radiating medium including a large number of atoms initially at ground state capable of storing energy at a metastable level at a predetermined pressure uniformly distributed throughout said envelope, the characteristic frequency of said atoms in said metastable level being defined as ω_2, means for exciting the ground state atoms in said envelope to form a region in said envelope containing excited metastable atoms at a metastable level, and a laser source for introducing a beam of laser energy into said envelope at a frequency defined as ω_p, said laser energy causing spontaneous anti-



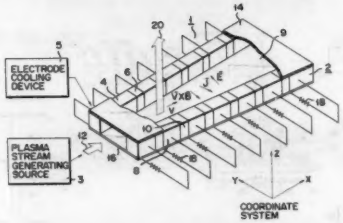
Stokes scattering from the atomic population stored in said metastable level at a radiating frequency ω_{UV} equal to $\omega_2 \pm \omega_p$ to provide high intensity light at said frequency ω_{UV}.

4,218,629

MHD POWER GENERATOR

Naoyuki Kayukawa, and Yasutomo Ozawa, both of Sapporo, Japan, assignors to The President of Hokkaido University, Sapporo, Japan

Filed Jul. 11, 1978, Ser. No. 923,497
Claims priority, application Japan, Jul. 28, 1977, 52/89730
Int. Cl.² H02N *4/02*
U.S. Cl. 310—11 **15 Claims**



1. An MHD power generator comprising means for generating a weakly ionized plasma stream, a pair of electrodes made of magnetic material and arranged opposite to each other, means for defining a plasma passage between the pair of electrodes through which the plasma stream flows from the plasma stream generating means, means for cooling the pair of electrodes, and a plurality of output lines each connected to the mutually facing electrodes so as to take out an electric power generated therebetween.

4,218,630

INSULATION STATOR FOR END TURN WINDINGS OF ELECTRIC ROTARY MACHINE

Takashi Watanabe, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 13, 1979, Ser. No. 29,839
Claims priority, application Japan, Apr. 15, 1978, 53/43809
Int. Cl.² H02K *3/46*
U.S. Cl. 310—260 **12 Claims**

1. A stator of an electric rotary machine, comprising:

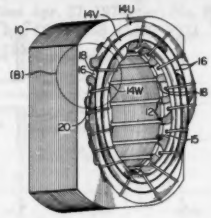
a stator core formed with a plurality of slots;

a stator winding composed of at least two different phase coils wound on said core through said slots;

an elongated insulating strap layer having a width and interleaved between said two different phase coils at sites outside said slots in a manner so that the width of said strap layer extends in the longitudinal direction of said respective slots; and

a plurality of binding yarns for binding said stator winding together with said insulating strap layer at sites outside said slots, each of said binding yarns being arranged in a manner so that it pierces through said insulating strap layer at a point at a predetermined distance from one of

the opposite side edges of said strap layer which is farther from said slot than the other end edge and binds said stator



winding together with a portion of said strap layer lying between the pierced point and said one side edge.

4,218,631

ELECTRODE STRUCTURE FOR THICKNESS MODE PIEZOELECTRIC VIBRATING ELEMENTS

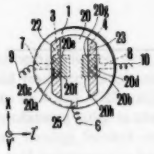
Kazumasa Yamaguchi, Machida, Japan, assignor to Kinsekisha Laboratory, Ltd., Komae, Japan

Filed May 30, 1978, Ser. No. 910,532

Claims priority, application Japan, Jun. 8, 1977, 52-67631; Aug. 23, 1977, 52-101206

Int. Cl.² H01L *41/10*

U.S. Cl. 310—312 **11 Claims**



1. In a thickness vibration mode piezoelectric vibrating element comprising a piezoelectric plate, a pair of exciting electrodes, of which one electrode is arranged on one major surface of said piezoelectric plate to oppose the other that is arranged on the other major surface of said piezoelectric plate so as to create an effective portion therebetween, and a vibration adjusting member for adjusting vibration frequency which is disposed on either one of said pair of exciting electrodes, the improvement wherein said vibration adjusting member overlaps said effective portion and is formed to extend within the peripheral boundary of said effective portion of said exciting electrode along the propagation line of the vibration energy caused by said pair of exciting electrodes while said vibration adjusting member extends beyond the peripheral boundary of said effective portion of said exciting electrode in the directions perpendicular to the propagation line towards the periphery of said piezoelectric plate.

4,218,632

GAS DISCHARGE DEVICE

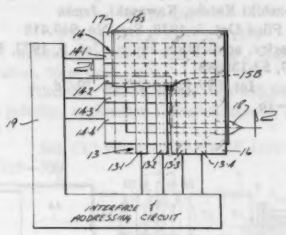
Roger E. Ernsthausen, Luckey; Michael E. Fein, and Bernard W. Byrum, Jr., both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 657,135, Feb. 11, 1976, Pat. No. 4,169,985, which is a continuation of Ser. No. 204,818, Dec. 6, 1971, abandoned. This application Jun. 7, 1978, Ser. No. 913,428

Int. Cl.² H01J *61/35*

U.S. Cl. 313—218 **6 Claims**

1. An article of manufacture having a configuration for use in a gaseous discharge device and comprising a dielectric material body having surfaces facing in opposite directions, a plurality of spaced electrically conductive elements on one of said surfaces, and on the other of said surfaces a surface deposit containing, as a source of bismuth, an inorganic non-oxide



compound of said bismuth, in an amount sufficient to provide uniform operating voltages and minimize aging cycle time.

4,218,633

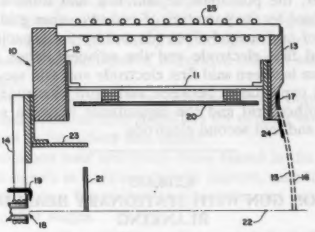
HYDROGEN HOLLOW CATHODE ION SOURCE

Michael J. Mirtich, Jr., N. Olmsted; James S. Sovey, Strongsville, and Robert F. Roman, Brookpark, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 23, 1978, Ser. No. 953,391

Int. Cl.² H01J *17/26*

U.S. Cl. 313—362 **6 Claims**



1. In a hydrogen ion source of the type comprising a chamber with an electron emitting cathode at the closed end thereof, an accelerator grid at the other end and an anode between the cathode and the accelerator grid, a screen grid being disposed between the anode and the accelerator grid, the improvement comprising:

a cylindrical metal baffle disposed coaxially around said cathode abutting said closed end;

a baffle disc positioned on the axis of said cathode, said disc being of smaller diameter than said cylindrical baffle, said disc being centered in said cylindrical baffle at the end opposite said closed end of the ion source;

said cathode comprising a porous tungsten tube impregnated with a low work function material and having an orifice plate at one end inwardly of the closed end of said ion source;

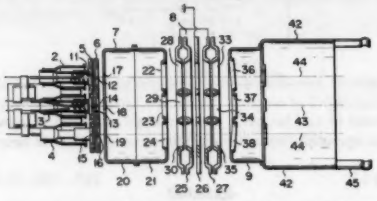
means for heating said tungsten tube to cause electron emission comprising heating coils swaged onto the outside of said cathode tube and a plurality of isolated layers of refractory metal foil disposed around the outside of said heating coils to efficiently heat the porous tube; and wherein hydrogen flows from a hydrogen supply through said cathode into said ion source;

a set of electromagnets to adjust discharge impedance and ionization efficiency and means for ionizing hydrogen flowing into said hydrogen ion source through said cathode.

4,218,634
ELECTRON GUN

Shigeo Takenaka, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 3, 1978, Ser. No. 949,418
Claims priority, application Japan, Oct. 5, 1977, 52-118963; Nov. 14, 1977, 52-135648
Int. Cl.[2] H01J 29/46, 29/56
U.S. Cl. 315—16 2 Claims



1. An electron gun comprising a plurality of focusing grids spatially arranged along the path of an electron beam generated from a cathode and each bored with at least one opening for allowing passage of the electron beam, wherein at least one of said plural focusing grids is formed between two other grids and includes a second electrode set at a grounding potential or a lower potential than a focusing voltage, and first and third electrodes arranged on opposite sides of said second electrode along the electron beam path and electrically connected with each other, the potentials of said first and third electrodes being defined by the potentials of said two other grids and the potential of said second electrode and by the capacitance between said first electrode and the adjacent other grid, the capacitance between said first electrode and said second electrode, the capacitance between said third electrode and the adjacent other grid and the capacitance between said third electrode and said second electrode.

4,218,635
ELECTRON GUN WITH STATIONARY BEAM DURING BLANKING

James F. Bedard, Schenectady, and William C. Hughes, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,096
Int. Cl.[2] H01J 29/70
U.S. Cl. 315—17 5 Claims

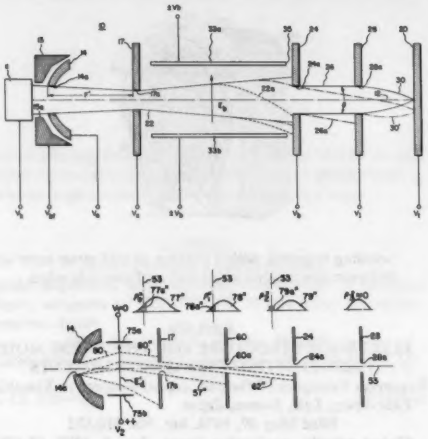
1. An electron gun for emitting a beam of electrons toward a target, comprising:

means for emitting electrons;

first means including a beam-forming electrode and an anode electrode sequentially arranged adjacent to said electron emitting means for forming the emitted electrons into a beam traveling along an axis of said electron gun and toward said target;

second means situated beyond said beam-forming first means and consisting of an object electrode, a blanking electrode and a spray electrode sequentially arranged each furthest from said electron emitting and first means and each having an aperture formed therethrough and positioned about said electron gun axis for allowing passage of only that portion of the formed beam lying along said axis and having a pre-determined diameter and divergence angle; and

blanking means positioned between said anode electrode of said first means and said object electrode of said second means for deflecting the electron beam emitted from said anode electrode of said first means from said axis to modulate the current density of the beam emitted from the electron gun with essentially no spatial motion of the modulated beam impingent on said target and to cause said beam to essentially impinge upon said object, blanking and spray electrodes of said second means when said blanking means receives a signal of at least a magnitude

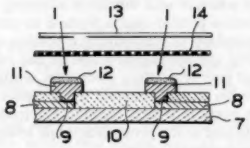


pre-determinately selected to reduce the current of said beam essentially to zero.

4,218,636
FLUORESCENT DISPLAY DEVICE

Hisashi Miyazawa, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Feb. 2, 1979, Ser. No. 9,180
Claims priority, application Japan, Feb. 8, 1978, 53-12307
Int. Cl.[2] H01J 63/06
U.S. Cl. 315—169.1 10 Claims



1. A fluorescent display device comprising:

a vacuum casing made up of a substrate and a front cover bonded to each other;

an insulating layer formed on said substrate;

a filamentary cathode provided in said vacuum casing for emitting thermions when energized and heated;

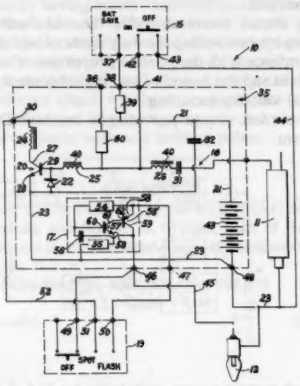
a control electrode provided in said vacuum casing for accelerating and controlling the thermions emitted from said filamentary cathode; and

a pattern display section composed of a plurality of anodes each coated with a phosphor layer for emitting light when the thermions impinge thereon, said phosphor layer being composed of mixed fluorescent materials each having different luminous color and threshold luminous voltage.

4,218,637
FLASHER CIRCUIT

John H. Zelina, Jr., Fairview, Pa., assignor to Lighting Systems, Inc., Erie, Pa.

Filed Apr. 27, 1978, Ser. No. 900,798
Int. Cl.[2] H05B 35/00; F21L 7/00
U.S. Cl. 315—313 7 Claims

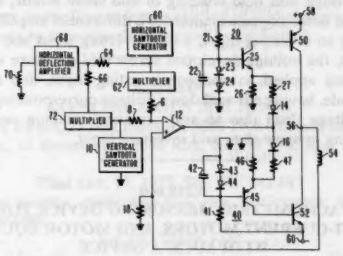


1. In combination, a light having an ionizable gas-containing lamp and an incandescent lamp,
an inverter circuit,
a flasher circuit,
a battery,
switch means,
said switch means being adapted to selectively connect said battery and said inverter circuit and said ionizable gas-containing lamp in series with each other whereby said ionizable gas-containing lamp is energized,
said switch means having further means to connect said flasher circuit, said incandescent lamp and said battery in series with each other whereby said incandescent lamp flashes,
said switch having further means connected to said battery and said incandescent lamp to connect said incandescent lamp directly to said battery, whereby said incandescent lamp is energized constantly,
said inverter circuit includes said ionizable gas-containing lamp,
capacitor means,
a first inductive means,
a second inductive means,
a third inductive means,
switching means having a control element,
said ionizable gas-containing lamp, said capacitor means, and said first and second inductive means being connected in series with each other,
said switching means having a first power element and a second power element,
said ionizable gas-containing lamp, said capacitor means and said first and second inductive means comprising,
a control circuit,
and said third inductive means and said first power element and said second power element being connected in series with each other and comprising,
a power circuit,
said control circuit being connected to said control element of said switching means,
magnetic coupling means connecting said first inductive means, said second inductive means, and said third inductive means together,
and means for connecting a power source to said power circuit whereby current flows in said third inductive means and induces current in said first inductive means and said second inductive means.

4,218,638
PUSH-PULL AMPLIFIER

David W. Breithaupt, Maple Shade, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,540
Claims priority, application United Kingdom, Apr. 10, 1978, 13899/78
Int. Cl.[2] H01J 29/70; H03F 3/26
U.S. Cl. 315—397 6 Claims

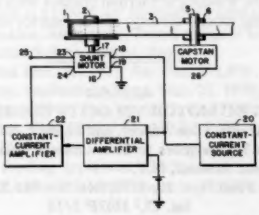


1. A push-pull amplifier comprising:
a pair of amplifier stages connected in push-pull;
a source of signals to be amplified;
a pair of common base amplifiers each having the collector coupled to and each being of a complementary type to the transistor at the input of respective ones of said amplifier stages;
said source of signals to be amplified being coupled to each of said common base amplifiers for driving said amplifier stages to reproduce said signal;
said common base amplifiers being biased in the absence of said signals as constant current sources, each independent of the other, for controlling the quiescent current of said amplifier stages.

4,218,639
TAPE TENSION CONTROL FOR TAPE RECORDING AND/OR REPRODUCING SYSTEM

Isao Sanguu, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 856,045
Claims priority, application Japan, Nov. 30, 1976, 51/144206
Int. Cl.[2] H02D 5/32
U.S. Cl. 318—6 2 Claims



1. A tape tension control system for tape recording and/or reproducing apparatus comprising a supply reel with a mass of tape wound thereon, a take-up reel arranged to wind up said tape as passed thereto from said supply reel, and a transducer provided on a tape path between said supply and take-up reels

for recording and/or reproducing signals on said tape, said control system comprising:

a shunt motor coupled to said supply reel for driving said supply reel during a rewinding period for said tape wound on said take-up reel, said shunt motor having a field winding and an armature winding; a current source for producing a constant current through said armature winding of said shunt motor;

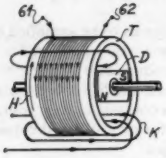
means for detecting an electromotive force induced in said armature winding, said detecting means including means for producing a voltage corresponding to the voltage drop due to said armature winding, and means responsive to said electromotive force for controlling the current through said field winding of said shunt motor, wherein said detecting means includes a differential amplifier having an inverting input, a non-inverting input and an output, the voltage developed across said armature winding being applied to said non-inverting input, and a zener diode, having a breadkdown voltage corresponding to the voltage drop due to said armature winding resistance being connected to said inverting input.

4,218,640

TACHOMETRIC MEASURING DEVICE FOR DIRECT-CURRENT MOTORS, AND MOTOR EQUIPPED WITH SUCH A DEVICE

Claude Vialatte, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 12, 1978, Ser. No. 941,581
Claims priority, application France, Sep. 16, 1977, 77 28071
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—331 **8 Claims**



1. In a tachometric measuring device for a direct-current motor equipped with a stator and a rotor, taking the form of an impedance bridge circuit having two branches, the motor being inserted into one branch, said bridge comprising two diagonals, the electrical energy feeding the motor being applied across the ends of one of the diagonals, and the electrical signal representing the speed of the motor being available across the ends of the other diagonal, the impedance in the branch comprising the motor, including a continuous resistive non-inductive winding in thermal contact with the motor, said winding being wound directly on the exterior side stator of the motor.

4,218,641

ANALOG DC MOTOR VELOCITY CONTROL LOOP

Robert W. Arnold, Glen Aubrey, and Louis V. Galetto, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,321
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—341 **3 Claims**

1. A velocity control system for a DC motor comprising:

a source of DC voltage drive pulses applicable to drive said motor;

means for controlling said source for maintaining the velocity of said DC motor substantially constant under variable loading conditions including,

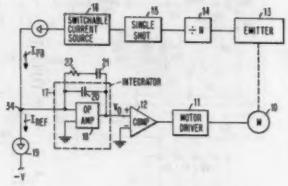
a feedback loop connected to modulate the duty cycle of said drive pulses provided by said source to said motor,

said feedback loop including means for producing digital feedback control pulses at a frequency proportional to the acutal velocity of said motor,

said digital control pulses having a reference interval of fixed time duration independent of the frequency of said control pulses; and

analog circuit means operable by said feedback control pulses for controlling the duty cycle of said drive pulse in accordance with the relative proportion of said reference interval and the period of said digital control pulses at the actual velocity including

a first current source providing a constant DC reference current,



a second current source switchable by said digital control pulses for providing a DC feedback current of fixed time duration correspondong to the reference interval of said binary control pulse;

said reference and feedback currents having opposite polarities and different amplitudes whereby a binary current signal is provided,

integrating means for converting said binary current signal to a sawtooth voltage signal which oscillates relative to a fixed DC reference voltage,

said sawtooth signal having one ramp of fixed slope and duration as a result of the integration of said binary current signal having said fixed time duration, and

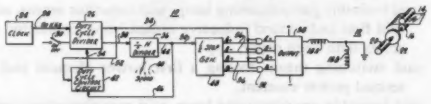
means for modulating the width of said DC voltage drive pulses applied to said motor in accordance with the interval between crossovers of said sawtooth voltage signal and said reference DC voltage.

4,218,642

STEPPER MOTOR RATE CONTROL

Gilbert A. Johnson, Mequon, Wis., assignor to Marquette Electronics, Inc., Milwaukee, Wis.

Filed Aug. 9, 1978, Ser. No. 932,341
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—696 **9 Claims**



1. A rate control suitable for use with a stepper motor having selectively energizable phase windings comprising:

pulse generating means providing a frequency signal at the output thereof having a predetermined cyclical motor energization interval, said pulse generating means being input signal responsive for providing during each interval, a stepping pulse occupying a preselected portion of said interval or a holding pulse occupying a lesser portion of said interval;

ratio means coupled to the output of said pulse generating means for generating a signal at the output of said ratio means indicative of a desired ratio of stepping pulses to holding pulses to be applied to the motor;

duty cycle control means coupled to said ratio means and responsive to the output signal thereof, said duty cycle control means being coupled to said pulse generating means and providing an input signal to said pulse generating means to cause said pulse generating to generate a pulse train output having a desired ratio of stepping pulses to holding pulses; and

output circuitry having inputs connected to said pulse generating means and said ratio means, said output circuitry having outputs couplable to the phase windings of said motor and being operable by signals from said pulse generating means and said ratio means for sequentially energizing selected phase windings in accordance with said stepping pulses and for reenergizing selected phase windings in accordance with said holding pulses.

4,218,643

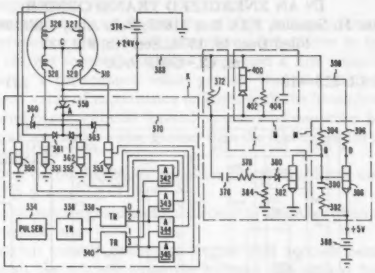
BRAKING SYSTEM FOR LOADED STEPPING MOTOR

Robert F. Herald, and Melvin G. Wilson, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,579

Int. Cl.[2] G05B *19/40*

U.S. Cl. 318—696 **10 Claims**



1. Control apparatus for a stepping motor which has a plurality of energizable stator coils for advancing the rotor of the stepping motor in response to the sequential energization of the stator coils, said control apparatus comprising:

means for providing a series of pulses at predetermined time intervals apart,

circuit means responsive to said pulses for sequentially energizing the stator coils at said predetermined time intervals,

means for measuring a final time interval subsequent to the last one of said pulses which is greater than said predetermined time intervals, and

means under the control of said time measuring means for shorting at least one of said stator coils at the expiration of said final time interval so that the induced voltage in said shorted coil creates a current through this coil braking rotor motion at this time.

4,218,644

TIME CONTROLLED BATTERY CHARGER

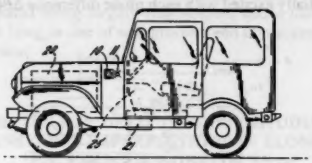
Robert F. Bourke, Kamiah, Id., and David K. Johansen, Lake In The Hills, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 19, 1978, Ser. No. 943,874

Int. Cl.[2] H02J *7/04*

U.S. Cl. 320—21 **12 Claims**

1. In an on-board charger for an electric vehicle, the vehicle having a propulsion battery, a propulsion motor, a power converter for controlling power from the battery to the motor and a charger for charging the battery, the improvement comprising, a stable oscillator for producing a clock signal, counter means responsive to said clock signal for producing a time of day output signal, means operative on said counter means for selecting the time of day at which said time of day output signal is produced, means responsive to the time of day signal for initiating a charging cycle at the preselected time of day,



and means controlling at least a portion of said charging cycle in response to time signals produced by said clock.

4,218,645

ASYNCHRONOUS MACHINES

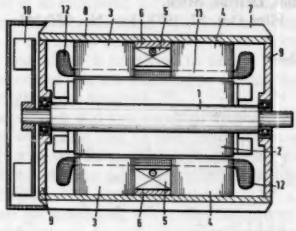
Bernhard Kirsch, 23 Im Litzelholz, 5500 Trier-Biewer, and Josef Wener, 15 Bergstrasse, 5559 Riol, both of Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,887

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646550

Int. Cl.[2] H02P *9/46*

U.S. Cl. 322—47 **10 Claims**



1. In an asynchronous machine including a rotor, a stator coaxial with the rotor and means for rotating the rotor relative to the stator at a speed other than synchronous speed, the improvement comprising coil means for varying the magnetic flux in the machine, said coil means including at least one annular coil having windings coaxial with the axis of rotation of the rotor and means for supplying direct current to said coil windings.

4,218,646

AC FEEDING APPARATUS AND ROTATING FIELD APPARATUS HAVING AC FEEDING APPARATUS

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 862,870

Claims priority, application Japan, Dec. 21, 1976, 51-154586; Dec. 23, 1976, 51-155915; Feb. 10, 1977, 52-13739

Int. Cl.[2] H02P *9/26;* H02M *7/00*

U.S. Cl. 322—72 **5 Claims**

1. In an AC feeding apparatus which comprises

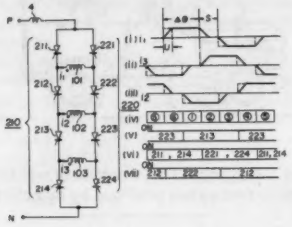
a plurality of series solid state switch groups connected in parallel;

each series solid state switch group comprising N solid state switches connected in series;

AC windings for $n(n \geqq 1)$ phase and $m(m \geqq 2)$ independent groups of windings which are respectively connected to corresponding contacts of series connections of solid state switches of the series solid state switch groups;

an improvement characterized in that N numbers of the solid

state switches in each group, and m groups of AC windings have the relation of $2m \geqq N \geqq (m+1)$ and at least two groups among m groups of the AC windings are sequentially excited with each phase difference $\Delta\theta(\neq\pi)$ in



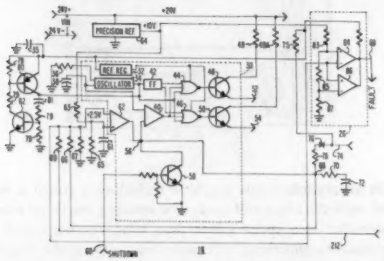
the turn-on control of the solid state switches by a turn-on control means, and at least one group of the AC windings is bypassed in the turn-on control of the solid state switches.

4,218,647

VOLTAGE REGULATOR WITH CURRENT LIMITING CIRCUITRY

Frank J. Haas, Harper Woods, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 27, 1978, Ser. No. 955,241
Int. Cl.² G05F *1/58*
U.S. Cl. 323—9 **4 Claims**



1. A voltage regulator having current limiting circuitry and receiving an unregulated input voltage from an electrical energy source and supplying a regulated D.C. voltage at its output, said voltage regulator comprising:

an operational amplifier means having an inverting input terminal, a noninverting input terminal and an output terminal, said operational amplifier having a substantially high output impedance;

reference voltage circuit means, connected as an input signal to said noninverting input terminal of said operational amplifier, for providing a reference voltage thereto;

power amplifier controlling means, connected to said electrical energy source and said output terminal of said operational amplifier means, for providing a regulated DC output voltage at its output;

means for connecting said output of said power amplifier controlling means as an input signal to said inverting input terminal of said operational amplifier means, with said operational amplifier providing at its output terminal an output signal that is the difference between said two input signals connected thereto;

overcurrent detection means, having on and off states, for detecting when the current drawn by a load exceeds a predetermined magnitude, said output of said overcurrent detection means being connected to said output terminal of said operational amplifier, said overcurrent detection means being operative to lower the magnitude of the output voltage of said operational amplifier means when said current drawn by said load exceeds said predetermined magnitude;

integrating means, connected to said output terminal of said operational amplifier means, for providing an average value of said magnitude of said output voltage of said operational amplifier means; and

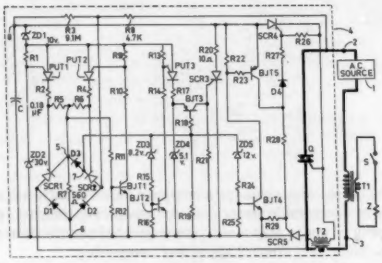
feedback means, connected between said output terminal and said inverting input terminal of said operational amplifier means, for feeding back a portion of the magnitude of said output voltage of said operational amplifier means so as to modify the gain of said operational amplifier and cause a linear reduction in said magnitude of said output voltage of said operational amplifier means which acts, through said power amplifier controlling means, to linearly reduce the magnitude of the output current of said voltage regulator to a level sufficient to remove said overcurrent condition.

4,218,648

ARRANGEMENT FOR REDUCING NO-LOAD CURRENT IN AN ENERGIZED TRANSFORMER

Victor H. Sansum, P.O. Box 11805, Palo Alto, Calif. 94306

Filed Dec. 19, 1978, Ser. No. 971,027
Int. Cl.² G05F *3/00*
U.S. Cl. 323—18 **11 Claims**



1. A power transformer controlling circuit comprising

a triac for controlling the flow of electric current from an AC source to the primary winding of a power transformer,

an electrical load connected through a controlling switch to the secondary winding of said power transformer,

a means for allowing a test current, having a magnitude which varies directly with the input admittance of said power transformer, and is small relative to the magnitude of the current that would flow through the primary of said power transformer if said AC source were connected directly and exclusively to said power transformer, to flow from the AC source through the primary winding of said power transformer while said triac is not conducting,

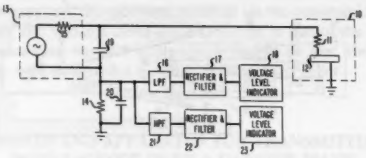
a means for firing said triac if the magnitude of said test current exceeds a first threshold, said first threshold having a value greater than the magnitude of the current that flows through the primary of said power transformer if said electrical load is not connected to the secondary of said power transformer, but less than the magnitude of the current that flows through said power transformer when said electrical load is connected to the secondary of said power transformer, and

a means for sustaining conduction of said triac, once fired, for the duration of the time that said electrical load remains connected to the secondary winding of said power transformer.

4,218,649
HIGH VOLTAGE LEAKAGE AND BREAKDOWN TEST CIRCUIT

Walter G. Kutzavitch, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1978, Ser. No. 899,393
Int. Cl.[2] G01R 31/12, 31/02
U.S. Cl. 324—54 4 Claims



1. A combination for testing a circuit to determine if leakage and/or insulation breakdown failures occur under a predetermined input voltage, and, furthermore, to determine if said leakage, when present, is in excess of a predetermined value and if said breakdown, when present, has capacitance in series therewith which exceeds a predetermined value, said combination comprising

a first parallel circuit formed by a high voltage source of alternating current having an internal impedance to limit its current to non-hazardous levels and a first capacitor having a capacitance value greater than the predetermined value of capacitance in series with the breakdown,

a second parallel circuit formed by a second capacitor having a capacitance value greater than the first capacitor and a resistor,

a pair of output terminals, between which the circuit under test is connected,

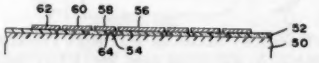
means connecting said parallel circuits in series between said terminals, and

a detector circuit connected across said second parallel circuit to indicate when the voltage thereacross has a frequency equal to that of said source, identifying a leakage failure, and an amplitude in excess of a predetermined level, characterizing the leakage as hazardous, and, furthermore, to indicate when the voltage thereacross has a frequency in excess of that of said source, identifying a breakdown failure, and when the value of capacitance in series with the breakdown exceeds the predetermined value, characterizing the breakdown as hazardous.

4,218,650
APPARATUS FOR MEASURING SEMICONDUCTOR DEVICE RESISTANCE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Walter J. Matzen, Richardson, Tex.

Filed Jun. 23, 1978, Ser. No. 918,534
Int. Cl.[2] G01R 27/02, 27/14
U.S. Cl. 324—62 2 Claims



1. In combination with a body of material whose resistance is to be measured, apparatus for use in making such a measurement comprising:

first and second electrical terminals, each disposed against a surface of said body of material, said second terminal extending in a closed path on said body surface, and said first terminal lying within said path so that said first terminal is surrounded by said second terminal;

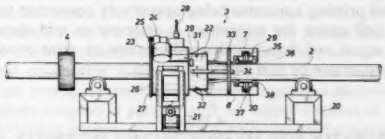
a layer of insulative material lying on the surface of said body, said insulative layer having a plurality of narrow grooves therein, and wherein

each of said electrical terminals includes a wide layer lying on said insulative layer, with the wide layer on said second terminal being largely ring shaped, and a narrower portion lying in one of said grooves and contacting said body surface.

4,218,651
APPARATUS FOR DETECTING LONGITUDINAL AND TRANSVERSE IMPERFECTIONS IN ELONGATED FERROUS WORKPIECES

Leon H. Ivy, Box 1325, Alvin, Tex. 77511

Continuation of Ser. No. 786,689, Apr. 11, 1977, abandoned, which is a continuation of Ser. No. 599,177, Jul. 25, 1975, abandoned. This application Aug. 2, 1978, Ser. No. 930,131
Int. Cl.[2] G01R 33/12, 1/04
U.S. Cl. 324—227 3 Claims



1. Mechanism for detecting the presence and location of an imperfection in an elongated ferrous workpiece, comprising

magnet means for establishing a first localized magnetic field which is extremely small relative to the workpiece as a whole and which is restricted to only a portion of said workpiece and of a size expected to contain the imperfection sought to be detected,

means for moving said first localized magnetic field relative to said workpiece and to said imperfection to create a distortion in said field which is functionally proportional to said imperfection and which is large relative to the size of said field,

coil means for generating a first electric current responsive and proportional to said distortion resulting from the presence of said imperfection in said first localized field,

second magnet means for establishing a second localized magnetic field which is extremely small relative to the workpiece as a whole and which is restricted to only a portion of said workpiece and of a size expected to contain the imperfection sought to be detected,

second means for moving said workpiece relative to said second field to create a distortion in said second field which is functionally proportional to said imperfection and which is large relative to the size of said second field,

second coil means for generating a second electric current responsive and proportional to said distortion in said second field resulting from the presence of said imperfection in said second field,

said first coil means being disposed in a direction transverse to the axis of the workpiece, said second coil means being disposed parallel to the axis of the workpiece,

amplifier circuit means having the input thereof coupled to both said coil means and amplifying the electromotive force signals received at said input,

signal display means being coupled to said amplifier circuit means and rendering a display that is responsive to the electrical signals received from said amplifier circuit means,

said signal display means including a galvanometer mechanism capable of relating electrical signals into mechanical form,

printing apparatus being connected to said galvanometer and providing a printed display of said electrical signals in graphical form,

graph means being located adjacent said galvanometer and

being contacted by said printing apparatus, said printing apparatus printing a graphical display of said electrical signals on said graph means,

said galvanometer mechanism comprising

a circuit board having an electrical circuit printed thereon and defining a plug portion,

a plurality of electrical contacts being defined on said plug portion of said circuit board and being electrically connected to said printed electrical circuit, said plug portion being adapted for insertion into a galvanometer control console receptacle for connection to appropriate galvanometer actuating circuitry,

a magnet being fixed to said circuit board and having a pair of spaced legs defining the poles of the magnet,

a torsion bar being secured between the legs of said magnet,

electrical coil means connected to said printed electrical circuit, said coil means being supported by said torsion bar and being rotated against the restraining force of said torsion bar responsive to the electrical signal being applied to said coil, and

said printing apparatus being operatively connected to said coil means for movement in response to said electrical signal and being positioned relative to print receiving apparatus by said coil means.

4,218,652

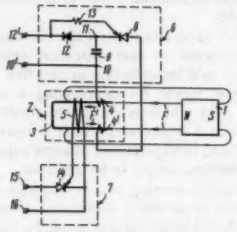
APPARATUS FOR MEASURING THE INTENSITY AND DIRECTION OF EXTERNAL MAGNETIC FIELDS INCLUDING POWER SUPPLY AND RECORDING UNITS HAVING RESPECTIVE SEMI-CONDUCTOR DEVICES

Alexandr P. Panov, proesd Polbina, 32, kv. 119, and Anatoly P. Salmin, ulitsa Karaganova, 2, kv. 65, both of Ulyanovsk, U.S.S.R.

Continuation of Ser. No. 598,983, Jul. 24, 1975, abandoned. This application Sep. 21, 1978, Ser. No. 945,195

Int. Cl.[2] G01R *33/02*

U.S. Cl. 324—253 **7 Claims**



1. A device for measuring the intensity and direction of external magnetic fields, comprising a differential ferroprobe including a core, field windings on said core and a working winding on said core; a power supply unit including a power source connected to said field windings; a recording unit connected to said working winding and including output terminals; the improvement wherein said power supply unit comprises a diode; a capacitor having first and second terminals; said first terminal of said capacitor being connected to one terminal of said power source and one lead to said field windings; said other terminal of said capacitor being connected to the anode of said diode; the cathode of said diode being connected to the other terminal of the power source; and bistable semi-conductor means connected to said power source for selectively connecting the capacitor to said field windings depending on the polarity of the power source, said recording unit comprising further bistable semi-conductor means connected to said working winding for operatively connecting said output terminals to the working winding depending on the polarity of the voltage induced in said working winding.

4,218,653

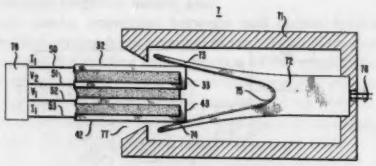
CONNECTOR CONTACT CONTAMINATION PROBE

George C. Emo, Gahanna, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 12, 1978, Ser. No. 950,723

Int. Cl.[2] G01R *31/02*

U.S. Cl. 324—421 **8 Claims**



1. Apparatus for use with electrical resistance measuring equipment (78) to detect and measure contamination of a contact terminal (72) of a connector (7) having

a test head assembly (6) for use in testing the connector, and probe apparatus (1) positioned in said test head assembly for use in coupling the connector contact terminal to the electrical resistance measuring equipment,

characterized in that

said probe apparatus comprises

an insulative support member (2) having a rectangular body section (21) with an elongated member (22) extending from end thereof, and

contact apparatus (3, 4) having a pair of dielectric elements (31, 41) affixed to said support member and each having a surface plated with electrical conducting elements (32, 42) joined at one end to form a folded electrode (33, 43) at the tip of said elongated member for engaging the connector contact terminal and free at the other end to form two terminals (34, 35, 44, 45) for connecting said folded electrode to the resistance measuring equipment.

4,218,654

SPACE DIVERSITY SYSTEM IN TDMA COMMUNICATION SYSTEM

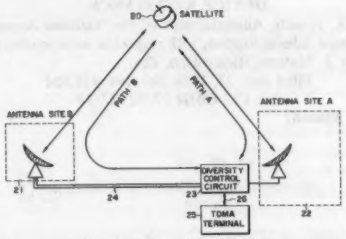
Akira Ogawa, Machida; Tatsuo Watanabe, Mitaka, and Hideki Saito, Tanashi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,287

Claims priority, application Japan, Apr. 28, 1978, 53-51272

Int. Cl.[2] H04L *7/00*

U.S. Cl. 370—97 **2 Claims**



1. A space diversity system in a TDMA communication system employing a communication satellite including: equalizing means for equalizing the path lengths of respective sending paths at the start of communication; said equalizing means comprising pre-burst sending means for sending a pre-burst out to one of the paths making up the diversity system in a time slot of one frame assigned to an instant station; sub-burst sending

means for sending a sub-burst out to the other of the paths in the assigned time slot; time difference detecting means for detecting a relative time difference between the pre-burst and the sub-burst from signals sent back to the instant station from the communication satellite or signals received by a distant terrestrial station via the communication satellite; comparison means for comparing a relative time difference between the pre-burst and the sub-burst at the time of their sending-out from the instant station with a relative time difference between the pre-burst and the sub-burst received via the communication satellite; and variable delay means inserted in one of the paths and controlled by said comparison means so that the two relative time differences become equal to each other.

4,218,655

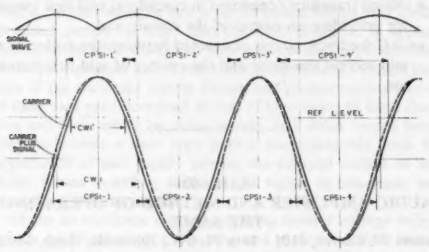
METHOD AND APPARATUS FOR TRANSMITTING INTELLIGENCE OVER A CARRIER WAVE

Reed H. Johnston, Wellesley; Dennis C. Jeffreys, Bedford, and Lawrence J. Stratton, Lexington, all of Mass., assignors to New England Power Service Company, Westborough, Mass.

Division of Ser. No. 590,941, Jul. 1, 1975, Pat. No. 4,106,007, which is a continuation-in-part of Ser. No. 489,450, Jul. 19, 1974, abandoned. This application Dec. 14, 1977, Ser. No. 860,656

Int. Cl.[2] H03K *7/08*

U.S. Cl. 455—39 **14 Claims**



1. A method for digitally transmitting intelligence in which a carrier wave having a predetermined function is modified while the carrier wave is performing the predetermined function and without impairing the function, said method comprising the steps of:

1. combining a signal wave with the carrier wave by adding the signal wave to the carrier wave to produce a composite wave having a recognizable pattern of variations in the durations of the intervals defined by preselected locations in the composite wave without impairing the function of the carrier wave, said pattern of variations in the durations of the intervals representing at least a portion of the digital intelligence to be transmitted; and,
2. extracting from the composite wave the digital intelligence represented by the pattern of variations in interval durations therein.

4,218,656

ARRANGEMENT FOR THE REMOTE TRANSMISSION OF INFORMATION FOR THE REMOTE GUIDANCE OF VEHICLES WHICH ARE SUBJECT TO SEVERE ACCELERATION

Michel Lazarus, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 15, 1978, Ser. No. 887,417

Claims priority, application France, Mar. 25, 1977, 77 08997

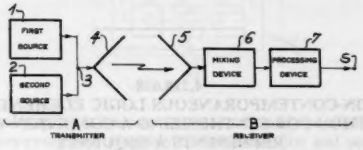
Int. Cl.[2] H04B *7/00*

U.S. Cl. 455—59 **16 Claims**

1. An arrangement for the remote transmission of information comprising means for transmitting information carrying electromagnetic signals and means for receiving said signals, wherein said means for transmitting includes:

first and second sources generating first and second signals having different frequencies F1 and F2 respectively, one of said first and second signals carrying said information to be transmitted and the other providing a frequency translation signal for said means for receiving, and wherein said means for receiving includes:

signal mix means for mixing said first and second signals to produce a third signal modulated with said information and having a frequency F3 equal to the difference be-



tween F1 and F2 wherein said signal mix means includes a receiving antenna having an output terminal and non-linear conduction means coupled to said output terminal, said non-linear conduction means including a microwave diode coupled in parallel with an output channel of said receiving antenna and means for biassing said microwave diode into its zone of non-linear conduction, said non-linear conduction means thereby supplying in operation said modulated signal having frequency F3; and

a circuit for processing said signal of frequency F3 coupled to said signal mix means.

4,218,657

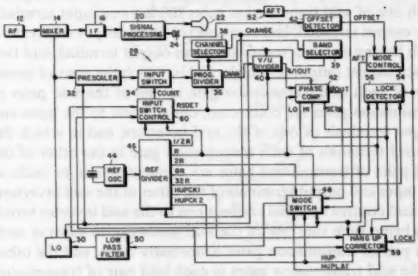
HANGUP CORRECTOR USEFUL IN LOCKED LOOP TUNING SYSTEM

Robert M. Rast, Noblesville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 11, 1978, Ser. No. 904,848

Int. Cl.[2] H04B *1/26*; H03B *3/06*

U.S. Cl. 455—182 **10 Claims**



1. Apparatus comprising:

a source of a reference frequency signal;

controllable oscillator means for generating a signal having a frequency controlled in response to a control signal;

control means for generating said control signal in response to the magnitude and the sense of at least one of the phase and frequency deviation between said controlled frequency signal and said reference frequency signal;

detector means for generating a lock signal when said deviation is less than a predetermined magnitude, said deviation being normally reduced to said predetermined magnitude no later than the end of a predetermined time interval after the initiation of the operation of said apparatus;

timing means for generating a timing signal having a dura-

tion corresponding to said predetermined time interval; and

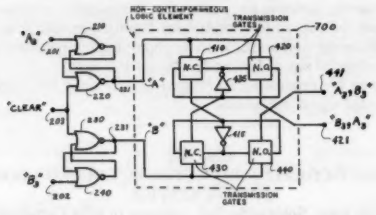
correction means to which said timing means and said detector means are coupled for coupling a correction signal to said controllable oscillator means at the end of said timing signal in the absence of said lock signal, said correction means including sense means for detecting the sense of change of said control signal at the end of said timing signal, said correction signal having a sense of change opposite to that of said control signal at the end of said timing signal so that said deviation is reduced.

4,218,658

NON-CONTEMPORANEOUS LOGIC ELEMENT AND METHOD FOR SYNTHESIZING A CONDITION WHICH REPRESENTS A SEQUENCE

Charles R. Moeller, 2133 Oxford Ave., Cardiff-by-the-Sea, Calif. 92007

Filed Oct. 17, 1977, Ser. No. 843,159
Int. Cl.² H03K *5/00, 5/18*
U.S. Cl. 328—109 **3 Claims**



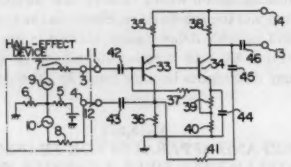
1. A logic element which synthesizes a condition corresponding to the temporal order of the non-contemporaneous inception of a pair of maintained input signals consisting of two logic element input terminals; two pairs of transmission gates, each one of said transmission gates having one input terminal, one output terminal, and two control terminals; two inverters, each having an input terminal and an output terminal; and two logic element output terminals; and in which the control terminals of each said transmission gate in one of the said pairs of transmission gates are connected, one to each, to the input and output terminals of one of the said inverters; and in which the control terminals of each transmission gate in the other of the said pairs of transmission gates are connected, one to each, to the input and output terminals of the other of the said inverters, the said control terminal connections to the said inverter terminals being such that one of the said transmission gates in each said pair of transmission gates is normally open, and the other of the said transmission gates in each said pair of transmission gates is normally closed; and in which each of the said logic element input terminals is connected to the said input terminals of one each of the said pairs of transmission gates; and in which the output terminal of the said normally closed transmission gate in each said pair of transmission gates is connected to the input terminal of the inverter which is connected, as said, to the other pair of transmission gates; and in which the output terminal of the said normally open transmission gate in each said pair of transmission gates is connected to one each of the logic element output terminals; and in which the pair of maintained input signals occurring in one temporal order cause a particular one of the two logic element output terminals to be activated, and in which the pair of maintained input signals occurring in the reverse temporal order cause the other of the two logic element output terminals to be activated.

4,218,659

AMPLIFIER CIRCUIT FOR A HALL-EFFECT HEAD

Takao Arai, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 26, 1979, Ser. No. 6,912
Claims priority, application Japan, Jan. 27, 1978, 53-7256
Int. Cl.² H03F *15/00, 3/183*
U.S. Cl. 330—6 **8 Claims**



1. An amplifier circuit for a Hall-effect head comprising a Hall-effect element with two Hall current terminals and two Hall voltage terminals in which one Hall current terminal is connected to ground and the other to a DC voltage supply circuit, comprising:

a first transistor having its base and emitter to be connected to said two Hall voltage terminals, respectively to provide a differential output at its collector;

a second transistor connected in cascade to said first transistor providing an output of the circuit; and

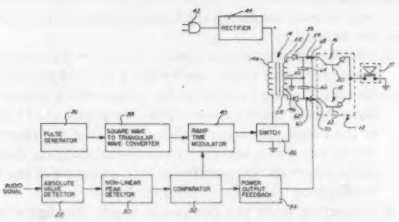
an AC feedback circuit connected between the collector of said second transistor and the emitter of said first transistor.

4,218,660

AUDIO AMPLIFIER AND METHOD OF OPERATING THE SAME

Robert W. Carver, 6101 - 14th Pl. SW., Edmonds, Wash. 98020

Filed Nov. 6, 1978, Ser. No. 958,141
Int. Cl.² H03F *3/21, 3/26*
U.S. Cl. 330—297 **50 Claims**



20. A method of amplifying a signal, such as an audio signal, said method comprising:

a. directing a series of current pulses through a primary winding of a transformer to cause voltage pulses to be imposed on a secondary winding of the transformer,

b. converting and transmitting said voltage pulses into a time varying D.C. voltage to supply power to the input terminals of an amplifier means which is responsive to said signal so as to amplify said signal,

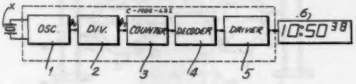
c. controlling power of the pulses transmitted to the primary winding, in a manner to increase and decrease power of said pulses as said signal increases and decreases in amplitude, in a manner that power delivered to the amplifier means is related to power requirement of the amplifier means to provide an output corresponding to the signal.

4,218,661

C-MOS CRYSTAL OSCILLATOR INCLUDING CIRCUIT FOR TEMPORARILY INCREASING CLOSED LOOP GAIN

Yoichi Imamura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,926
Claims priority, application Japan, Nov. 22, 1976, 51/140361
Int. Cl.[2] H03B 5/04, 5/06, 5/36
U.S. Cl. 331—116 FE 17 Claims



1. In an oscillator circuit including a vibrator and a first inverter means having an input terminal and an output terminal for producing a high frequency signal at the output terminal, the output terminal being fed back through the vibrator to the input terminal to define a predetermined closed loop gain, the improvement comprising control means for producing a control signal for a predetermined period of time after electrical supply power is applied to said oscillator circuit, means to temporarily disable said first inverter means while said supply power is being applied whereby initial oscillations are delayed, and secondary inverter means adapted to be selectively coupled in parallel with the first inverter means during said predetermined period of time that the control signal is applied thereto to thereby reduce the impedance at the output terminal of the first inverter means and thereby increase the closed loop gain of the oscillator circuit during said predetermined period of time, said predetermined period of time being of fixed duration and determined by delay means, said delay means being reset to initiate a new time period simultaneously with the application of said supply power, the delayed output of said delay means resetting said control signal to uncouple said secondary inverter means.

11. In an oscillator circuit operating from a voltage supply means and including a vibrator and a first inverter means having an input terminal and an output terminal for producing a high frequency signal at the output terminal, the output terminal being fed back through the vibrator to the input terminal to define a predetermined closed loop gain, the improvement comprising control means for producing a control signal when the voltage from said supply means decreases to a predetermined value, and secondary inverter means adapted to be selectively coupled in parallel with the first inverter means during the period of time that the control signal is applied thereto to thereby reduce the impedance at the output terminal of the first inverter means and thereby increase the closed loop gain of the oscillator circuit.

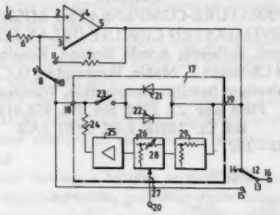
4,218,662

CIRCUIT ARRANGEMENT FOR OPTIONAL DYNAMIC COMPRESSION OR EXPANSION

Ernst Schröder, Hanover, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,394
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735597; Dec. 10, 1977, 2755144
Int. Cl.[2] H04B 1/64; H03G 7/00
U.S. Cl. 333—14 17 Claims

1. In a circuit arrangement for automatic dynamic compression and/or expansion, which circuit arrangement includes an input terminal, an output terminal, an amplifier connected to present a forward conducting path for useful signals between the input and output terminals, means connected to the amplifier to define a negative feedback path therefor, and an auxiliary circuit having first and second connection points via which the auxiliary circuit is connected in one of the paths, the improvement wherein said auxiliary circuit comprises: a series-connected assembly of a first damping member, an electronically controllable damping member and an amplifying member connected between said first and second connection points;



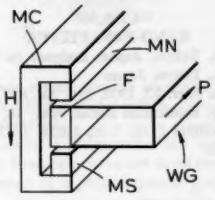
and signal amplitude limiting means connected in parallel with said series-connected assembly between the first and second connection points for limiting the amplitude of the signal in said assembly.

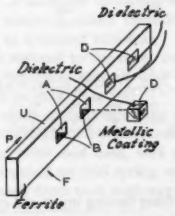
4,218,663

WAVEGUIDE POWER LIMITER

Leonard K. Brundle, Haywards Heath; Stuart R. Longley, Oxted, and Michael D. Coleman, Reigate, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,134
Claims priority, application United Kingdom, Mar. 16, 1977, 11103/77
Int. Cl.[2] H01P 1/22, 1/34
U.S. Cl. 333—17 L 15 Claims





1. A microwave power limiter comprising a rectangular waveguide section having a pair of opposed wide walls and a pair of opposed narrow walls, said section further having an input port at one end for receiving a microwave signal and an output port at the other end, and a slab of ferrite material positioned in said waveguide section adjacent one of said narrow walls, said slab having at least one cavity containing a dielectric, non-magnetic material, the size of said cavity and the dielectric constant of said dielectric material being such that, upon application of a magnetic biasing field to said ferrite slab, when the power level of said signal at said input port exceeds a first value, the power level of the signal at said

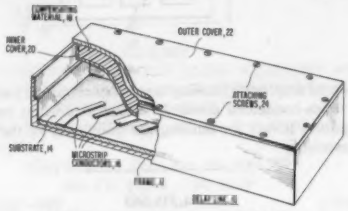
output port is limited to a second predetermined value which is dependent on the size of said cavity and the dielectric constant of said dielectric material.

4,218,664

TEMPERATURE-COMPENSATED MICROWAVE INTEGRATED CIRCUIT DELAY LINE

Tsvi F. Assal, Bethesda; Arnold Berman, Kensington, both of Md., and Christoph E. Mahle, Washington, D.C., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Aug. 22, 1978, Ser. No. 935,419
Int. Cl.[2] H01P *9/00, 1/30, 3/08*
U.S. Cl. 333—156 **17 Claims**



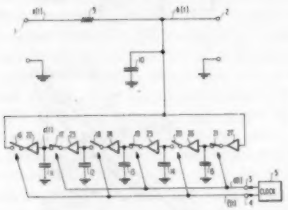
1. A microwave integrated circuit delay line device comprising in combination:
a substrate of dielectric material;
a plurality of conductive strips disposed on a surface of said substrate to form a delay line; and
means for maintaining the delay time for signals propagating along said delay line substantially constant over a predetermined range of temperature for at least a predetermined frequency.

4,218,665

BAND-PASS FILTER

Hisashi Fujisaki, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Mar. 17, 1978, Ser. No. 887,909
Claims priority, application Japan, Mar. 18, 1977, 52-30629
Int. Cl.[2] H03H *7/10, 7/30;* **H03K** *5/153, 5/159*
U.S. Cl. 333—165 **3 Claims**



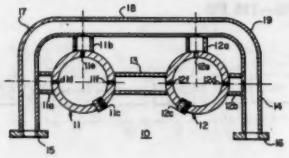
1. A band-pass filter having input and output terminals and a common terminal comprising:
a lowpass filter consisting of a resistor connected between said input and output terminals and a capacitor connected between said output terminal and said common terminal;
a clock signal generator for generating a clock signal;
an analog signal delay circuit responsive to said clock signal generator and connected to said output terminal for sampling the voltage of said capacitor and delaying the sampled voltage according to said clock signal; and
means connected between the output of said analog signal delay circuit and said output terminal and actuated in synchronism with said clock signal for approximately equalizing the voltage of said capacitor to the output voltage of said analog signal delay circuit.

4,218,666

DUAL MODE BAND REJECTION FILTER

Richard V. Snyder, Ringwood, N.J., assignor to Premier Microwave Corporation, Port Chester, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,877
Int. Cl.[2] H01P *7/06, 1/16;* **H01D** *1/20*
U.S. Cl. 333—211 **18 Claims**



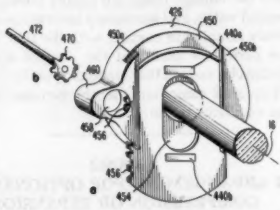
1. A dual mode band reject filter comprising
at least one resonant cavity having a pair of modes of propagation, said cavity having first and second ports for transfer of energy into and out of said cavity, and
transmission means coupled to said first and second ports including an input section coupled to said first port, an intermediate section coupled between said first and second ports and an output section coupled to said second port, the length of said intermediate section providing a predetermined phase shift between said first and second ports.

4,218,667

CONVERGENCE ADJUSTMENT ARRANGEMENT USING MAGNETIC TABS WITH DIFFERENTIAL MOTION

William H. Barkow, Pennsauken, and Robert W. Shisler, New Egypt, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 951,001, Oct. 13, 1978, abandoned. This application Mar. 9, 1979, Ser. No. 18,906
Int. Cl.[2] H01F *1/00*
U.S. Cl. 335—212 **11 Claims**

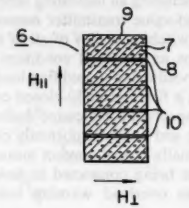


1. A convergence correction arrangement for a deflection yoke disposed about and substantially coaxial with the neck of an in-line beam kinescope, comprising:
first and second magnetic field influencing means disposed contiguous with the yoke for modifying a deflection field developed by said yoke, said first and second field influencing means being located at positions diametrically opposed with respect to the axis of said kinescope neck; and
mounting means for maintaining a fixed separation between said first and second field influencing means and for providing for simultaneous differential adjustment of the proximity of said first and second means to said kinescope neck axis.

4,218,668
SUPERCONDUCTIVE MAGNET DEVICE

Naofumi Tada, and Katsuzo Aihara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 28, 1978, Ser. No. 882,042
Claims priority, application Japan, Mar. 1, 1977, 52/22335; Jun. 10, 1977, 52/67922
Int. Cl.[2] H01F 7/22
U.S. Cl. 335—216 18 Claims

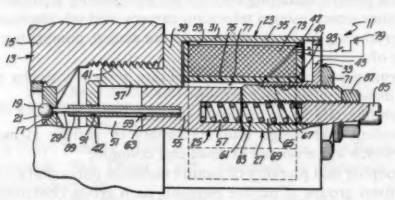


1. A superconductive magnet device comprising a coil assembly having a plurality of coil sections stacked along a center axis of said coil assembly, each of said coil sections being formed by winding a composite superconductive wire, which exhibits different superconductivities in one direction to another direction perpendicular to said one direction in a cross section of said wire, in layers in a direction perpendicular to said center axis, wherein the innermost wire of at least a central one of said coil sections is made up of electrically connected segment wires each having a critical current density which is larger in the direction perpendicular to the center axis than in the direction parallel to the center axis and exhibits a critical current density which is large in the direction parallel to said center axis than in a circumferential direction of said coil assembly.

4,218,669
ADJUSTABLE SHORT STROKE SOLENOID

Melvin L. Hitchcock, Santa Ana; Ralph D. Ray, Costa Mesa, and Eugene H. Felder, Jr., Fountain Valley, all of Calif., assignors to SR Engineering, Newport Beach, Calif.

Filed Sep. 13, 1978, Ser. No. 941,984
Int. Cl.[2] H01F 7/13, 7/16
U.S. Cl. 335—258 9 Claims

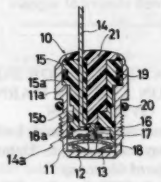


1. A solenoid for moving an external member comprising:
a housing having a passage extending through the housing;
a coil in said housing;
a pole piece in said passage;
an armature;
means for mounting the armature in said passage for linear movement along a path toward and away from the pole piece;
means defining a nonmagnetic gap between the coil and both of said pole piece and said armature;
resilient means for urging the armature in one direction along said path, said coil being energizable to move the armature in opposition to the resilient means in the other direction along said path;
an elongated actuator member for moving the external member;
means for mounting the actuator member on said armature with said actuator member extending beyond said armature whereby the actuator member moves linearly along said path with said armature between an extended position and a retracted position;
first means for adjusting the force which the resilient means applies to the armature to move the armature in said one direction along said path;
second means for adjusting the location of said actuator member along said path whereby the position of the actuator member relative to the external member can be altered; and
said armature having a tubular section and said actuator member mounting means including a tube mounted in said tubular section of said armature, said actuator member being received in said tube.

4,218,670
THERMOSTATIC CIRCUIT BREAKER

Tsukasa Watanabe, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Oct. 12, 1978, Ser. No. 950,823
Claims priority, application Japan, Oct. 31, 1977, 52-130403
Int. Cl.[2] H01H 37/52
U.S. Cl. 337—349 7 Claims



1. A thermostatic circuit breaker comprising:
a case acting as a first terminal which comprises electrically conducting material;
a temperature sensitive thermostatic disk installed in the case and movable from one curvature to an opposite curvature upon occurence of a perdetermined temperature condition;
a stator of electrically insulating material secured at a predetermined position in said case including a plate of electrically conducting material axially extending through said stator and acting as a second terminal;
a stationary contact secured to the inner end of said plate;
a movable contact movable toward and away from said stationary contact by said disk; and
an off-set spring of electrically conducting and elastic material supported by said stator by the elasticity thereof and directly contacted with said case, said movable contact being securely mounted on said spring which is normally urged to move away from said stationary contact.

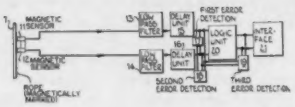
4,218,671
MINE CAGE POSITION DESCRIBER

David C. Lewis, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 27, 1978, Ser. No. 946,241
Claims priority, application United Kingdom, Oct. 10, 1977, 42013/77
Int. Cl.[2] B66B 3/02
U.S. Cl. 340—21 13 Claims

1. Equipment for monitoring movement of a member along an elongate path along which a magnetizable component is extensible, the magnetizable component being magnetized such that a magnetic field is induced adjacent thereto, the

induced magnetic field intensity varying longitudinally of the magnetizable component and along said elongate path insofar as the magnetizable component is extended therealong, said induced magnetic field defining a wave like pattern of constant pitch, the equipment including a magnetic detector component comprising two magnetic sensors arrangeable adjacent to the magnetizable component and spaced from one another by an amount differing from said pitch or from one quarter of said pitch or from multiples of one quarter of said pitch, one of the components being movable with respect to the other component as the member moves, the two magnetic sensors deriving a first electrical signal and a second electrical signal respective electrical signals in response to the magnetic field sensed adjacent to the magnetizable component, said electrical signals varying as said wave like pattern and being out of phase by an amount dependent upon said amount of spacing of the sensors, error detecting means for differentiating error components from information components in the derived electrical signals and sequential analysis means for deriving a further signal indicative of the magnitude and direction of movement of the member from the derived electrical signals.



4,218,672

INSTALLATION IN A VEHICLE FOR INDICATING THE LOAD DISTRIBUTION AND FOR WARNING AGAINST OVERLOADS

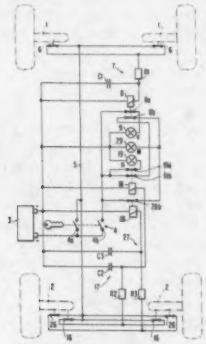
Helmut Weisshappel, and Walter Schmid, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 2, 1977, Ser. No. 821,250

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2636889

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—52 R **20 Claims**



1. An installation in a vehicle for indicating load distribution and warning against overloads comprising an electrical power source and ignition switch means for activating said power source, load-value transmitter means coordinated to a vehicle axle including at least a first load value transmitter means having at least one load dependent threshold switch coordinated with the vehicle axle at respective lateral sides of the vehicle for detecting predetermined threshold load values, said threshold switches being operatively connected to said power source through said ignition switch means, indicator means for indicating load distribution and overload conditions of said vehicle, monitoring means connected to said threshold switches for monitoring functioning and/or operation of said indicator means, and switching means connected between said monitoring means and said indicator means for activating said indicator means, the installation further including a second load-value transmitter means coordinated to the axle including a pair of threshold switches adjusted to a larger load, and wherein said monitoring means and said switching means are associated with the said second load value transmitter means, said indicating means including an indicating lamp coordinated to each of the first load-value transmitter means, and in that upon response of the switching means of all of the first load-value transmitter means an overload condition is indicated, said switching means coordinated to said first load-value transmitter means including a first normally closed contact means which operatively connects an associated indicating means with said power source and a second normally closed contact means, the second normally closed contact means of all load-value transmitter means being connected in series and being operable to connect an overload warning lamp with said power source.

4,218,673

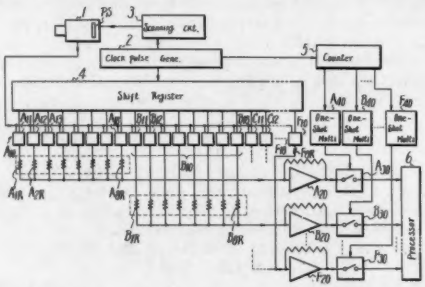
PATTERN MATCHING METHOD AND SUCH OPERATION SYSTEM

Hajime Yoshida, Chofu, Japan, assignor to Hajime Industries, Ltd., Tokyo, Japan

Filed Oct. 27, 1977, Ser. No. 846,212

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 MA **12 Claims**



1. A pattern matching method for recognizing a pattern on a picture screen using a television camera, said television camera producing an image of said picture screen, comprising the steps of:

forming said pattern on said picture screen whereby said image contains said pattern;

scanning said image in line sequence;

dividing said image into a plurality of picture elements which are arranged in rows and columns;

grouping said plurality of picture elements into a plurality of fixed groups of picture elements each group containing a plurality of contiguous picture elements, each group of picture elements including a plurality of contiguous picture elements over at least two adjacent rows, a last picture element of each group being contiguous with a first picture element of the next group;

all groups having the same number of picture elements;

electrically summing picture information in said picture elements of each of said groups of picture elements;

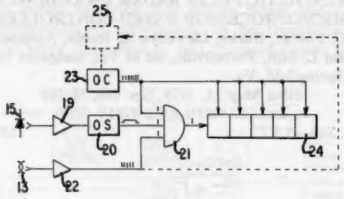
comparing the respective sums from all of said groups of picture elements with corresponding stored sums corresponding to groups of picture elements of at least one reference pattern; and

producing an electrical output indicating recognition of said pattern when the measured sums are substantially equal to the stored sums.

4,218,674
METHOD AND A SYSTEM FOR VERIFYING AUTHENTICITY SAFE AGAINST FORGERY

Jorgen Brosow, Hof, Australia, and Erik Furugard, Anieres, Switzerland, assignors to Dasy Inter S.A., Geneva, Switzerland

Continuation of Ser. No. 611,608, Sep. 9, 1975, abandoned. This application Apr. 20, 1978, Ser. No. 898,149
Int. Cl.[2] G05B *1/00;* G06K *7/08, 5/00;* G11B *5/02*
U.S. Cl. 340—149 A 6 Claims



1. A system for verifying the authenticity safe against forgery of a document by comparison of binary output signals therefrom with binary output signals previously stored, said system comprising:

(1) a document having randomly dispersed fibers of a magnetic or magnetizable material embedded within at least part of the base material of said document in order to give said documents an imperfection pattern individual thereto, said fibers having magnetic properties different from said base material,

(2) means for detecting said fibers in a predetermined measuring track over the surface of said document,

(3) means to convert said detected random fibers into an asymetric analogous pulse train,

(4) discriminator means for separating such pulses from said pulse train which have amplitudes exceeding a predetermined threshold value from pulses having smaller amplitudes than said level,

(5) a converter for converting said first-mentioned pulses to a series of detected pulses,

(6) means for producing a measuring start and stop signal defining the active scanning time period,

(7) a timing means supplying timing pulses, said timing means being indicia on the surface of said document, and

(8) means to coordinate said series of detected pulses and said timing pulses to produce a series of binary output signals, whereby a comparison will develop the indentity of said document.

4,218,675
SERIAL-PARALLEL ANALOG-TO-DIGITAL CONVERTER USING VOLTAGE LEVEL SHIFTING OF A MAXIMUM REFERENCE VOLTAGE

Pern Shaw; Fuad H. Musa, both of Austin, Tex., and Stephen J. Kreinick, San Diego, Calif., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 17, 1977, Ser. No. 807,470
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD 11 Claims

1. An analog-to-digital converter comprising:

(a) means for receiving an analog signal;

(b) first comparator means responsive to said analog signal and including

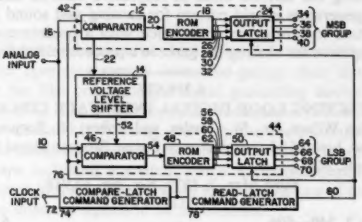
(i) means for providing a first series of reference voltages ranging between a minimum reference voltage and a maximum reference voltage,

(ii) a first plurality of differential comparison circuits, each having associated with it one of said first series of reference voltages, each of said differential comparison circuits in said first comparator means comprising

a current splitting network having first and second terminals for providing first and second increments of current when said analog signal is less than said associated reference voltage; and

means having a third terminal for providing a third increment of current when said analog signal exceeds said associated reference voltage;

(iii) a plurality of first output means each having an output terminal, each of said first output means being coupled to said first terminal of an associated, differential comparison circuit and to said third terminal of an adjacent differential comparison circuit, and a pair of second output means each having an output terminal, one of said second output means being coupled to said first terminal of the differential comparison circuit associated with said minimum reference voltage, and one of said second output means being coupled to said third terminal of the differential comparison circuit associated with said maximum reference voltage, one of said output means generating a first output signal at its output terminal in the absence of any current increment input to such output means;



(iv) means for providing a constant current signal; and

(v) current summing means responsive to said second terminals for adding said second increments of current to form a reference current;

(c) first encoder means responsive to said first output signal for producing a first digital number;

(d) a reference voltage level shifting circuit responsive to said maximum reference voltage, said constant current signal, and said reference circuit for producing a shifted maximum reference voltage;

(e) second comparator means including

(i) means responsive to said shifted maximum reference voltage for providing a second series of reference voltages, said second series of reference voltages differing from said first series of reference voltages; and

(ii) comparison means responsive to said second series of reference voltages and said analog signal for generating a second output signal; and

(f) second encoder means responsive to said second output signal for producing a second digital number.

4,218,676
METHOD FOR CHASING GAME EMPLOYING A SET OF TIMED SOUND GENERATORS

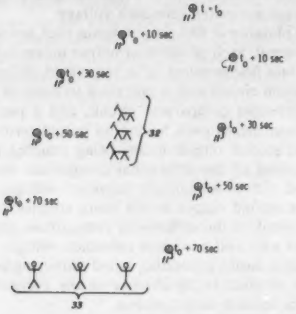
Daniel A. Worsham, 1300 Pine St., San Jose, Calif. 95125, and John D. Schmidt, 868 Robb Rd., Palo Alto, Calif. 94306

Filed May 23, 1977, Ser. No. 799,468
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—384 E 1 Claim

1. In a method for chasing game, the steps of:

setting out in the field a set of portable self-contained sound generators in a pattern relative to a region where it is expected the game will be at the start of the chase for chasing the game in a predetermmined direction when said sound generators are turned on, each of said sound generators having a clock associated therewith and means for setting the turn-on time of said respective sound gener-

ator to a time within at least a few seconds of the desired turn-on time such that precise timing of the turn-on time of respective ones of said set of said sound generators is settable as desired; and



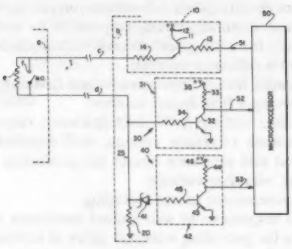
setting the turn-on times of respective ones of said sound generators in said pattern for causing said sound generators to turn on in accordance with a predetermined sequence for chasing the game in a predetermined direction.

4,218,677

DETECTING LOOP DIGITAL INTERFACE CIRCUITRY

Stanley Wilson, Jr., St. Charles, and Robert M. Borger, Overland, both of Mo., assignors to Potter Electric Signal Co., St. Louis, Mo.

Filed Mar. 2, 1979, Ser. No. 16,918
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—506 **6 Claims**



1. For use in an alarm system of the type utilizing a detecting loop having an input lead extending from a central station to a remote protection zone, a return lead extending from the remote protection zone to the central station, such input and return leads being subject to grounding and open loop interruptions, such detecting loop further having a loop resistance in parallel connection with a normally open detection switch which closes upon the occurrence of an alarm condition, both coupled between such input and return leads in the remote protection zone,

detecting loop digital interface circuitry comprising

means, coupled to such input lead at the central station, to introduce an input voltage on such input lead and to limit the current therein,

a ground resistor coupled from a reference point on the return lead at the central station to substantially ground potential, whereby to provide voltage division with such loop resistance which effects a normal intermediate voltage level at said reference point,

a first voltage-sampling branch coupled to said reference point at such central station including active pull-up circuit means to produce a high digital signal at its output when the voltage at said reference point substantially exceeds zero volts, and

a second voltage-sampling branch coupled to said reference point at such central station including voltage level detector and active pull-up circuit means to produce a high digital signal at its output when the voltage at said reference point exceeds said normal intermediate voltage level,

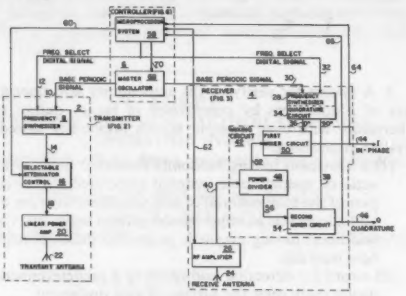
whereby said voltage-sampling branches produce combinations of digital signals indicating normal, alarm, and loop interruption conditions.

4,218,678

SYNTHETIC PULSE RADAR INCLUDING A MICROPROCESSOR BASED CONTROLLER

James C. Fowler, Burke; Llewellyn A. Rubin, Annandale, and William L. Still, Purcellville, all of Va., assignors to Ensco, Inc., Springfield, Va.

Filed May 11, 1979, Ser. No. 38,289
Int. Cl.[3] G01S *9/02*; G01V *1/00*
U.S. Cl. 343—5 FT **15 Claims**



12. A synthetic pulse radar for detecting geophysical phenomena at a maximum range of up to 500 feet, comprising

(a) a transmitter means for approximating the Fourier transform of a radar short pulse suitable for transmission toward and modulation by a geophysical target by generating during each of a plurality of successive time intervals one of a corresponding plurality of periodic component signals each of which has a uniquely discrete frequency between 16 MHz and 160 MHz separated by at least 100 KHz; and

(b) receiver means for determining representative parameters of each said periodic component signal which has been modulated by the geophysical phenomena being measured to permit derivation of information about the geophysical phenomena, said receiver means including mixing means for producing a parameter signal representing said recovered parameter for each broadcasted periodic component by mixing a recovered electrical signal representative of a portion of the energy of each periodic component modulated by said geophysical phenomena with a reference signal having a frequency signal equal to the original frequency of the period component signal broadcast by said transmitter means.

4,218,679

AIRBORNE OR GROUND STATION FOR A RADIO NAVIGATION SYSTEM AND PARTICULARLY A DME SYSTEM

Manfred Böhm, and Günther Peuker, both of Stuttgart, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 1, 1978, Ser. No. 956,553
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749406
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.5 R **2 Claims**

1. A station for a radio navigation system of the type that

radiates a phase and pulse modulated ratio frequency signal, including:

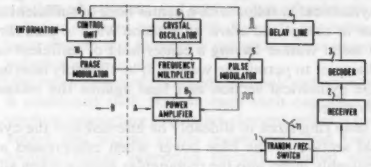
means for providing a trigger signal;

means for providing the radio frequency signal including an oscillator means;

means responsive to the trigger signal for pulse modulating the radio frequency signal to provide a pulse modulated signal having a predetermined pulse shape;

means for transmitting said pulse modulated radio frequency signal;

control means receiving said trigger signal and a signal corresponding to information to be transmitted, said means being responsive to said received signals for pro-



viding a control signal corresponding to the information to be transmitted; and

phase modulating means responsive to the control signal for providing a phase modulation signal to the oscillator means, said phase modulation signal corresponding to the information to be transmitted and having a shape generally corresponding to the predetermined pulse shape, whereby the oscillator means is responsive to the phase modulation signal so that the radio frequency signal is phase modulated and the phase deviation of the phase-modulated radio frequency signal relative to the unmodulated radio frequency signal as a function of time approximately corresponds in shape to that of the pulse amplitude as a function of time.

4,218,680

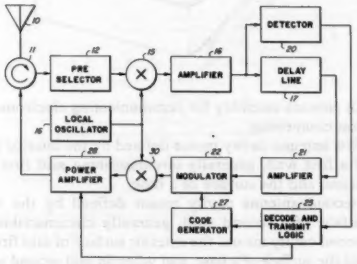
CODED COHERENT TRANSPONDER

Peter D. Kennedy, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 12, 1979, Ser. No. 2,821

Int. Cl.² G01S 9/56

U.S. Cl. 343—6.8 R **7 Claims**



3. A coded coherent transponder with a receiver and a transmitter for receiving an interrogation signal and transmitting a coherent response including predetermined coded information, said transponder including means for introducing a predetermined coded amplitude shift into the coherent response representative of a simultaneous plurality of Doppler frequency components.

4,218,681

HAND-HELD TRANSMITTER FOR TRANSMITTING DIFFERENT SIGNALS

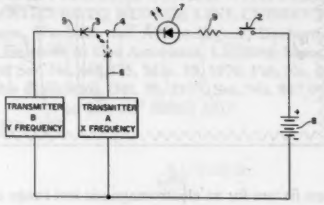
Michael Hörmann, Steinhagen, Fed. Rep. of Germany, assignor to Hörmann KG, Fed. Rep. of Germany

Filed Feb. 13, 1979, Ser. No. 11,844

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 7804106[U]

Int. Cl.² H04B 7/00

U.S. Cl. 455—603 **8 Claims**



1. In a hand-held transmitter for the wireless transmitting of signals for operating remote-controlled garage door installations or the like comprising a signal generating device, an energy source, and a hand-operable transmitter switch built into the transmitter housing, the improvement comprising means for selectively transmitting at least two different signals, said means including a switch which is position-dependent with respect to the force of gravity for selecting one of said at least two different signals to be transmitted.

4,218,682

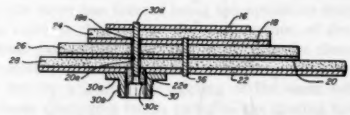
MULTIPLE BAND CIRCULARLY POLARIZED MICROSTRIP ANTENNA

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and I-Ping Yu, Thousand Oaks, Calif.

Filed Jun. 22, 1979, Ser. No. 51,270

Int. Cl.² H01Q 1/38

U.S. Cl. 343—700 MS **20 Claims**



1. An antenna assembly for communicating electromagnetic radiation comprising:

(a) ground plane means;

(b) first antenna element means, for communicating at a first frequency band, comprising a generally elliptical lamina of electrically conducting material, separated from said ground plane means;

(c) second antenna element means, for communicating at a second frequency band, comprising a generally elliptical lamina of electrically conducting material, positioned generally between said first antenna element means and said ground plane means, and separated from both said first antenna element means and said ground plane means;

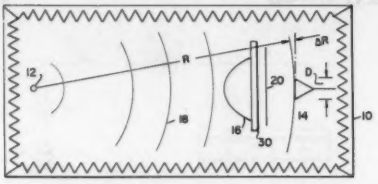
(d) feed means, comprising electrical conducting means contacting said first antenna element means at a feed point, communicating through, said electrically insulated from, said second antenna element means and said ground plane means; and

(e) conducting means for electrically connecting said second antenna element means with said ground plane means.

4,218,683
RANGE FOCUS LENS

Leland H. Hemming, Poway, Calif., assignor to Plessey, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 783,719, Apr. 1, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,906
Int. Cl.[2] H01Q 1/28
U.S. Cl. 343—703 26 Claims



13. A test fixture for an electromagnetic test range comprising:

a movable supporting structure;

an electromagnetic radiation antenna mounted on said structure;

a dielectric plane wave lens mounted on said structure in a fixed, spaced relation to said antenna, said lens being formed of a uniformly foamed plastic having a dielectric constant in the range of 1.05 to 1.5;

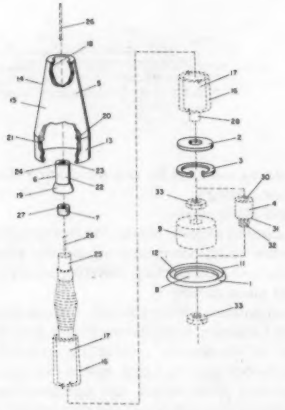
a radiation-absorbing layer adjacent only the side of said lens adapted to face a test object; and

radiation-absorbing material surrounding the radiation path between said antenna and said lens.

4,218,684
SECURITY COVER FOR TRUNK AND ROOF MOUNTED ANTENNAE

William Northcutt, 1001 Alcazar, NE., Albuquerque, N. Mex. 87110

Filed May 14, 1979, Ser. No. 38,875
Int. Cl.[2] H01Q 1/42
U.S. Cl. 343—715 4 Claims



1. A security cover for an antenna mounted on an automobile comprising:

a. a base pad constructed of resilient material;

b. a base cover which has a cylindrical section, and a truncated conical section and a swivel section all integrally formed, and a rectangular shoulder at the juncture of the cylindrical section and truncated conical section and a rectangular groove, adjacent to the rectangular shoulder, circumferentially around inside surface of the cylindrical section, and said base cover having a concave, generally spherical surface on the inner side of the swivel section;

c. a top cover which has a cylindrical side, a top, an antenna port, and a convex shoulder all integrally formed wherein the antenna port is a circular hole in the top sized to accept an antenna whip and the convex shoulder is adjacent to the open end of the cylindrical side and the convex shoulder is on the outside of the cylindrical side, the convex shoulder being sized and shaped to slideably mate with the generally spherical surface on the inner side of the swivel section of the base cover;

d. a resilient bushing, made of resilient material, generally cylindrical in shape with a center bore of sufficient diameter to accept and allow an antenna whip to pass through;

e. a metal washer having a center hold of sufficient outside diameter to permit the washer to be slideably inserted into the cylindrical section and bear against the rectangular shoulder;

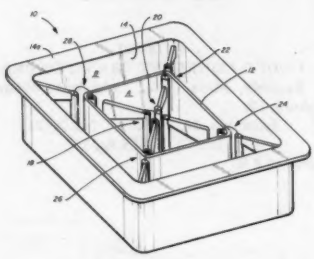
f. a snap ring sized to slideably be inserted into the cylindrical section of the base cover when compressed and to mateably insert into the rectangular groove when allowed to expand, yet after inserting into the rectangular groove the snap ring bears against the washer;

g. an adapting stud with a female end threaded to mateably connect with a mounting stud on an antenna body, and said adapting stud having a male end threaded to accept a nut and a bearing surface to bear on a vehicle surface.

4,218,685
COAXIAL PHASED ARRAY ANTENNA

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Haynes Ellis, Jr., Chino, Calif.

Filed Oct. 17, 1978, Ser. No. 953,313
Int. Cl.[2] H01Q 21/26
U.S. Cl. 343—727 9 Claims



1. An antenna assembly for communicating electromagnetic radiation comprising:

(a) first antenna cavity means defined by the interior surface of a first wall, generally circumscribing said first cavity means, and the surface of a base;

(b) second antenna cavity means defined by the interior surface of a second wall, generally circumscribing said second cavity means, the exterior surface of said first wall, and the surface of a base, and wherein said second antenna cavity means generally circumscribes said first antenna cavity means, is substantially axially coextensive therewith, and possesses a common central, longitudinal axis therewith;

(c) first and second dipole radiation means, positioned in cross-dipole configuration within said first antenna cavity means wherein each of said first and second dipole radiation means include balun means comprising, a balanced

segment and an unbalanced segment, and radiation element means such that each balun segment supports a radiation element means, both radiation element means thus supported by a single balun means being oriented along a common direction and in opposite senses away from each other, the direction of orientation of the radiation element means of said first dipole radiation means being orthogonal to the direction of orientation of the radiation element means of said second dipole radiation means; and,

(d) first, second, third, and fourth monopole radiation means positioned symmetrically relative to said second antenna cavity means for excitation therein and wherein

(1) each of said first, second, third, and fourth monopole radiation means includes balun means, each comprising a balanced segment and an unbalanced segment, and radiation element means such that only one balun segment of each said monopole radiation means supports a radiation element means;

(2) the balun means of each said monopole radiation means is positioned such that, in each such case, the balun segment supporting a radiation element means is located within said second cavity means with said radiation element means supported thereby oriented along a direction generally away from said first antenna cavity means, and said other balun segment not supporting a radiation element means is located within said first antenna cavity means;

(3) said first and third monopole radiation means are positioned mutually diametrically opposed across said first antenna cavity means along the direction of orientation of said radiation element means of said first and third monopole radiation means extending in opposite senses generally along said direction; and

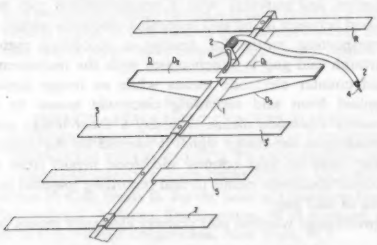
(4) said second and fourth monopole radiation means are positioned mutually diametrically opposed across said first antenna cavity means along said direction of orientation of said radiation element means of said second dipole radiation means, said radiation element means of said second and fourth monopole radiation means extending in opposite senses along said direction of orientation.

4,218,686

YAGI-TYPE ANTENNAS AND METHOD

Isaac S. Blonder, West Orange, N.J., assignor to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Feb. 23, 1978, Ser. No. 880,429
Int. Cl.[2] H01Q 1/02
U.S. Cl. 343—819 **22 Claims**



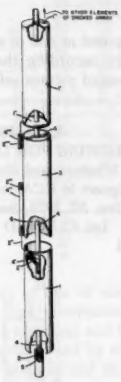
1. An improved Yagi-type antenna having, in combination, coaxial-line-fed antenna means having first and second portions, the first portion connected to the inner line of a coaxial line having an inner line and an outer line and the second portion connected to the outer line of the coaxial line and thus producing an unsymmetrical pattern; and parasitic conductive means spaced from but near the said antenna means and comprising first and second portions corresponding to and extending substantially parallel to the first and second portions, respectively, of the said antenna means, the second portion of the parasitic conductive means being of greater dimension than the first portion of the parasitic conductive means to introduce compensatory unsymmetrical parasitic interaction to render the pattern symmetrical.

4,218,687

BROADBAND DIPOLE ANTENNA SYSTEM WITH COAXIAL FEED-LINE COATED WITH FERRITE PARTICLES TO REDUCE LINE CURRENTS

Ivan Faigen, Wayland, and Ahmet Ergene, Boxboro, both of Mass., assignors to Chu Associates, Littleton, Mass.

Division of Ser. No. 668,475, Mar. 19, 1976, Pat. No. 4,087,823.
This application Oct. 31, 1977, Ser. No. 847,070
Int. Cl.[2] H01Q 1/52
U.S. Cl. 343—885 **1 Claim**



1. A broadband antenna operable with substantially uniform coverage over a band of frequencies f_1–f_2, where f_2:f_1 is of the order of at least 2:1, having, in combination, successive in-line antenna elements with gaps defined therebetween; and coaxial feed-line means disposed along the elements and connected therewith, the outer line thereof being susceptible to induced extraneous currents that reduce the performance of the antenna, at least part of said outer line external to the elements having a continuous absorbing composition formed directly on the outer line by a continuous coating of the same with a dielectric layer containing ferrite particles, the coating having length and thickness dimensions sufficient to reduce substantially said extraneous line currents, so as to permit operation of said antenna with substantially uniform coverage over said band of frequencies.

4,218,688

DEFORMOGRAPHIC STORAGE DISPLAY SYSTEM

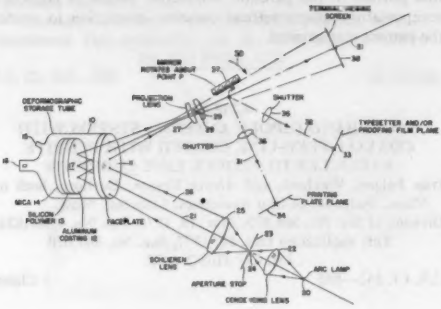
Lawrence M. Monari, North Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 29, 1977, Ser. No. 865,726
Int. Cl.[2] G11B 9/00
U.S. Cl. 346—74.1 **26 Claims**

6. In a data display system having a deformographic storage device upon which light for forming a display image of a deformographically-created pattern is directed, the improvement comprising:

first means for directing a first beam of light upon said deformographically-created pattern, whereby an image-containing output beam reflected from said deformographic storage device is obtained;

second means for reflecting said image-containing output beam onto a plurality of separate image planes; and



third means, disposed at one of said image planes, for thermomagnetically recording the image of said deformographically-created pattern reflected thereon.

4,218,689

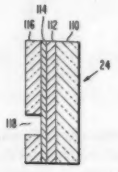
ABLATABLE MEDIUM FOR OPTICAL RECORDING

Allen Bloom, East Windsor, and Robert A. Bartolini, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,612

Int. Cl.[2] G01D *15/34*

U.S. Cl. 346—135.1 **5 Claims**



1. In an ablative optical recording medium which comprises a light reflecting material coated with a light absorbing ablative layer which upon exposure to light ablates to expose the light reflecting material, the improvement which comprises employing as the light absorbing ablative layer a smooth, clear continuous, amorphous layer consisting of 6,6'-diethoxythioindigo.

4,218,690

SELF-CONTAINED PROGRAMMABLE TERMINAL FOR SECURITY SYSTEMS

Bryan D. Ulch, Valencia; Donald P. Sturgis, Claremont, and Robert J. Fox, Los Angeles, all of Calif., assignors to A-T-O, Inc., Willoughby, Ohio

Filed Feb. 1, 1978, Ser. No. 874,283

Int. Cl.[2] H04Q *9/00*; **G06K** *5/00*; **G08B** *23/00*

U.S. Cl. 340—149 R **8 Claims**

1. A security access system, comprising:

a central processor, comprising:

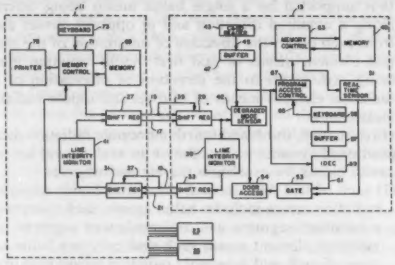
a programmable memory storing data specifying personnel access at plural remote terminals; and

means for communicating with said plural remote terminals; and

plural remote terminals connected by said communicating means with said central processor, each comprising:

a programmable memory within said terminal storing data specifying personnel access for said remote terminal; and

means within said terminal for providing selective, programmable access at a remote location in response to



either said central processor memory data or said remote terminal memory data.

4,218,691

RECORDING APPARATUS WITH IMPROVED COUNTER ELECTRODE

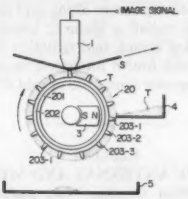
Tadashi Fujii, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 28, 1978, Ser. No. 937,162

Claims priority, application Japan, Aug. 30, 1977, 52-104053; Sep. 27, 1977, 52-115760; Dec. 3, 1977, 52-145464

Int. Cl.[2] G03G *15/08*

U.S. Cl. 346—153 **15 Claims**



1. In a recording apparatus of the type using magnetic toner and comprising:

recording electrode means for applying image signals;

counter electrode means for holding the magnetic tone thereon and movable with a predetermined gap maintained between it and said recording electrode means; and

a transporting means for passing a recording material through said gap in synchronism with the movement of said counter electrode means while an image signal is applied from said recording electrode means to said counter electrode means whereby a toner image corresponding to the image signal is formed on the magnetic toner held on said counter electrode means from said counter electrode means to said recording material in the area of said gap;

the improvement wherein said counter electrode means comprises:

an electrically conductive and ferromagnetic base portion on which the magnetic toner is held; and

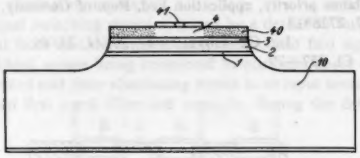
a plurality of non-conductive and non-magnetic convexities projecting outwardly from said base portion with substantially the same height and distributed uniformly throughout said base portion, and whose tip portions extend above the level of the magnetic toner held therebetween on said base portion and are brought into contact with the recording material when passing through said gap.

4,218,692

LIGHT-EMITTING AND LIGHT-RECEIVING DIODE PARTICULARLY FOR OPTICAL TELECOMMUNICATIONS

Baudouin de Cremoux, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 12, 1978, Ser. No. 950,792
Claims priority, application France, Oct. 18, 1977, 77 31274
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—19 7 Claims



1. A diode for emitting and detecting light of predetermined wavelength, comprising:

a substrate made of a semiconductor material having a first conductivity type;

a first semiconductor layer having said first conductivity type, being doped less heavily than and being disposed on said substrate, said first layer having a forbidden band transparent to said light;

a second layer, disposed on said first layer, made of a semiconductor material different from the semiconductor material of said first layer and being doped in said first conductivity type less heavily than said substrate, said second layer having a forbidden band suitable for absorbing and emitting said light of predetermined wavelength;

a third layer disposed on said second layer, made of a semiconductor material different from the semiconductor material of said second layer, and doped in a second conductivity type opposite to said first conductivity type less heavily than said substrate, said third layer having a forbidden band having a different value than the forbidden band of said second layer, said third layer forbidden band being transparent to said light; and

a fourth layer disposed on said third layer made of a semiconductor material different from the semiconductor materials of said second and third layers, and doped in said second conductivity type less heavily than said substrate, said fourth layer having a forbidden band of different value than said second and third layers, said fourth layer forbidden band being transparent to said light, said fourth layer including a central region and a peripheral region, said peripheral region having a greater resistance than said central region so that most of the current flowing through said fourth layer flows through said central region.

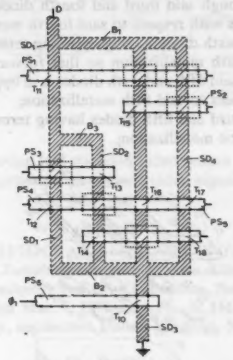
4,218,693

INTEGRATED LOGIC CIRCUIT HAVING INTERCONNECTIONS OF VARIOUS LENGTHS BETWEEN FIELD EFFECT TRANSISTORS OF ENHANCEMENT AND DEPLETION MODES

Lawrence F. Gee; Denis B. Jarvis, both of Chandlers Ford, and Christopher J. Aldhous, Southampton, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,052
Claims priority, application United Kingdom, Jan. 17, 1977, 1788/77
Int. Cl.[2] H01L *27/02, 29/78, 27/10;* H03K *3/353*
U.S. Cl. 357—41 11 Claims

1. An integrated circuit for the generation of at least one logic combination of applied logic input signals in a two-state logic system and comprising a semiconductor body having a part mainly of a first conductivity type, an array of insulated gate field effect transistors formed in said part and having gate electrodes self-registered with source and drain electrode regions, and a plurality of substantially parallel first conductive tracks which comprise the transistor gate electrodes and a plurality of substantially parallel strip-shaped surface regions of a second conductivity type opposite to that of the first which adjoin a surface of the body and cross the first conductive tracks, said transistors being formed at the crossings, said surface regions comprising the source and drain electrode regions of said transistors, a first group of the transistors being transistors of a first form having a first threshold voltage and a second group of the transistors being transistors of a second form having a second threshold voltage different from the first, said logic input signals in operation being applied to the gate



electrodes of the transistors of one of said first and second groups of transistors, said logic combination to be generated being predetermined by the crossings and the form of transistor present at each such crossing and by the interconnections of transistors of said one of said first and second groups via the second conductivity type strip-shaped surface regions, the array being a nonuniform array in which at least one of the plurality first conductive tracks and the plurality of strip-shaped surfaces regions are not all of the same length, said logic combination further being predetermined by further interconnections formed within the array, and said further interconnections comprising at least a branching of a selected strip-shaped region.

4,218,694

RECTIFYING APPARATUS INCLUDING SIX SEMICONDUCTOR DIODES SANDWICHED BETWEEN CERAMIC WAFERS

James P. Grzybowski, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 23, 1978, Ser. No. 954,008
Int. Cl.[2] H01L *23/32, 23/02, 23/12*
U.S. Cl. 357—76 1 Claim

1. A semiconductor full wave rectifier assembly for mounting in the alternator of an automobile including:

a generally planar first lower ceramic base having two opposing major surfaces, a first metallization covering a portion of and being coextensive with one of said major surfaces and a second metallization covering a portion of the other of said major surfaces, the area of a major surface of said lower ceramic base being about 1.2 inches by about 1.625 inches thereby providing small size and low weight for the rectifier assembly;

a second, third and fourth generally planar upper ceramic bases, each having two opposing major surfaces, the combined area of the major surfaces of said second, third and fourth ceramic bases being about equal to or less than the area of the major surfaces of said first lower ceramic base;

a third, fourth and fifth metallization covering at least a

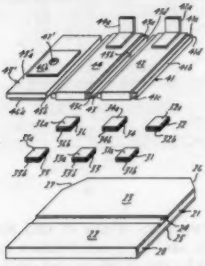
portion of and being coextensive with one major surface of said second, third and fourth ceramic bases, respectfully, and each of said upper ceramic bases including an opening therethrough between said two major surfaces adapted to receive a lead extending therethrough for electrically coupling each of said third, fourth and fifth metallizations to the other side of said second, third and fourth ceramic bases, respectively;

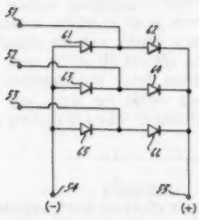
a first and second diode having opposing terminals connected to said third metallization so that forward current flow through said first and second diodes is in opposite directions with respect to said third metallization;

a third and fourth diode having opposing terminals connected to said fourth metallization so that forward current flow through said third and fourth diodes is in opposite directions with respect to said fourth metallization;

a fifth and sixth diode having opposing terminals connected to said fifth metallization so that forward current flow through said fifth and sixth diodes is in opposite directions with respect to said fifth metallization;

said first, third and fifth diodes having terminals connected to said first metallization;





said second, fourth and sixth diodes having terminals connected to said second metallization;

said third, fourth and fifth metallizations each being adapted to be connected to one of the three output phase of the alternator;

said first and second metallizations being adapted to provide a direct current output from said rectifier, said first metallization extending around an edge of said lower ceramic base and covering at least a portion of each of said two major surfaces, only one of said two opposing major surfaces being adjacent said diodes;

said upper and lower ceramic base being fabricated substantially of beryllia and having a sufficiently high heat transfer capability to cool said diodes during rectifying operation by providing for transfer of heat from said diodes through both said upper and said lower ceramic bases;

said metallization being molybdenum coated with copper so that the stress between the copper and the ceramic base due to thermal expansion is reduced; and

said diodes being semiconductor wafers and being removable from said rectifier assembly without disturbing more than one other semiconductor wafer thus increasing yield by permitting a defective diode to be removed.

4,218,695

SEMICONDUCTOR RECTIFIER HOUSING ASSEMBLY

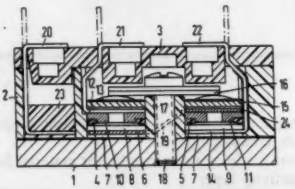
Werner Egerbacher; Heinz Martin; Werner Mitzkus, all of Munich, and Dieter Wunderlich, Geiselbullach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,197

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728313

Int. Cl.[2] H01L *23/42, 23/44, 23/46*

U.S. Cl. 357—79 **5 Claims**



1. Semiconductor component comprising a closed having having a base and a cover and being formed with a plurality of recesses therewithin, a plurality of semiconductor elements received in said recesses, respectively, and having at least two poles, a plurality of contact strips heat-conductively connected to and electrically insulated from said housing base, one of said poles of each of said semiconductor elements being in contact with a respective one of said contact strips and therethrough being in heat-conductive contact with said housing base, a plurality of supply electrodes, respectively, connected to another of said poles of the respective semiconductor elements, the respective contact strip in contact with said one pole of one of said semiconductor elements and the respective supply electrode connected to said other pole of another of said semiconductor elements being formed together of a single strip-like metal member having a crank formed therein so that the respective contact strip and the respective supply electrode are disposed in different planes, a crosspiece integral with and disposed in said housing between said recesses wherein said semiconductor elements are received, and at least one spring held by said crosspiece for yieldably biasing said supply electrodes against said semiconductor elements in direction toward said base, add a threaded fastening means extending through said crosspiece and substantially perpendicularly to said housing base for securing said spring to said crosspiece, said contact strips and said contact electrodes extending out of said housing and forming terminals for the respective semiconductor elements.

4,218,696

VIDEO SIGNAL COMPENSATION SYSTEM

Fusao Ushio, Hirakata, and Noboru Okuno, Sennan, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 13, 1978, Ser. No. 886,114

Claims priority, application Japan, Mar. 16, 1977, 52-29435

Int. Cl.[2] H04N *5/76, 9/535*

U.S. Cl. 358—8 **5 Claims**

1. A defect compensation system for a color video signal comprising:

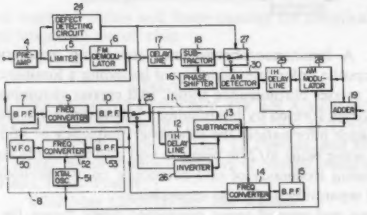
means for eliminating jitter in a frequency band including a chrominance signal component of a buried subcarrier color video signal in which a brightness signal and a chrominance signal are combined together in frequency interleaved relation;

defect detecting means for detecting a defect of said color video signal;

a first comb filter including a first delay line having a one-horizontal scanning period delay for extracting a chrominance signal component from the output of said jitter eliminating means;

means for phase inverting a portion of the output signal of said first delay line so that the phase of at least the chrominance signal in the output signal may be maintained with the phase of the chrominance signal at the output of said jitter eliminating means;

first signal switching means actuated by a detection output signal from said defect detecting means, said first signal switching means being connected to normally apply the output of said jitter eliminating means to an input terminal of said first comb filter and to apply, during the defect



period, the output of said phase adjusting means to the input terminal of said first comb filter;

a second comb filter means for subtracting the output signal of said first comb filter from said color video signal to extract only the brightness signal component;

second switching means actuated by the detection output signal from said defect detecting means, said second switching means being connected to normally apply the output of said second comb filter means to a first input terminal of an adder and to apply, during said defect period, a substitute signal comprising a delayed version of said second comb filter means output signal, to said first input terminal of said adder delayed by one horizontal scanning period through a second delay line; and

means for applying the output of said first comb filter to a second input terminal of said adder, whereby said adder produces a standard color video signal.

4,218,697

DIGITAL DATA TRANSMISSION ARRANGEMENT USING A STANDARD TV VIDEO

William Leventer, 62 Sutton Pl., Lawrence, N.Y. 11559

Filed May 8, 1979, Ser. No. 37,127

Int. Cl.² H04N *7/00*

U.S. Cl. 358—13 **14 Claims**

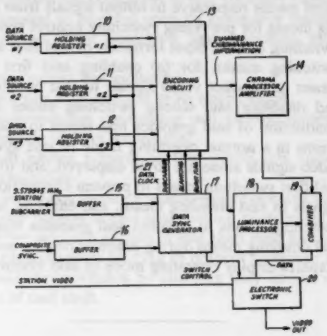
9. A system for transmitting encoded digital data in a standard color television video signal comprising:

means for providing up to three digital data input signals;

means, synchronized with the color subcarrier, for modulating red, green and blue chrominance signals with corresponding ones of said data input signals;

means, synchronized with the color subcarrier, for modulating a luminance signal;

means for combining said modulated chrominance signals and modulated luminance signal to provide an encoded video output signal; and



means for inserting said encoded video output signal during a selected portion of a standard video signal.

4,218,698

TV GRAPHICS AND MIXING CONTROL

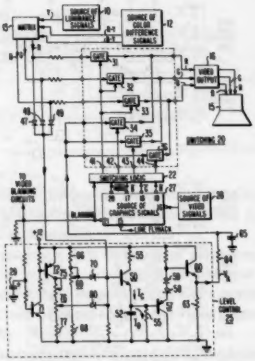
Theodor E. Bart, Zurich, and Ronald A. Mills, Küsnacht, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Mar. 6, 1979, Ser. No. 24,151

Claims priority, application United Kingdom, Mar. 13, 1978, 09893/78

Int. Cl.² H04N *5/22*

U.S. Cl. 358—22 **14 Claims**



1. In a video signal processing system including a video signal processing channel, a kinescope for displaying images derived from processed video signals, and means for coupling processed video signals from said video channel to intensity control electrodes of said kinescope, apparatus comprising:

a source of signals containing graphics information to be displayed by said kinescope;

means coupled to said source of signals for deriving therefrom signals representative of graphics information to be displayed;

bias means for providing a graphics intensity bias signal representative of a desired intensity level of displayed graphics information;

first switching means having a signal input terminal coupled to said video channel, a signal output terminal coupled to said coupling means, and a switching control input terminal;

second switching means having a signal input terminal cou-

pled to said graphics bias signal, a signal output terminal coupled to said coupling means, and a switching control input terminal; and

control means responsive to output signals from said deriving means for providing switching control signals to said switching control input terminals of said first and second switching means, for (a) enabling said first switching means to conduct video signals to said coupling means, and disabling said second switching means to prevent conduction of said graphics bias signal to said coupling means in a normal operating mode of said system when video signals alone are to be displayed, and (b) disabling said first switching means to prevent conduction of video signals to said coupling means, and enabling said second switching means to conduct said graphics bias signal to said coupling means during graphics display intervals in a graphics display operating mode of said system.

4,218,699

BLACK LEVEL CONTROL SYSTEM FOR A COLOR TELEVISION CAMERA

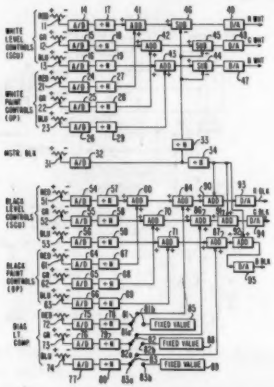
Robert A. Dischert, Burlington, and Robert L. Libbey, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 2, 1979, Ser. No. 17,040

Claims priority, application United Kingdom, May 12, 1978, 12990/78

Int. Cl.[2] H04N 9/535

U.S. Cl. 358—29 **8 Claims**



1. In a color television camera system having individual black level camera controls providing individual black level camera control signals and individual white level camera controls providing individual white level camera control signals and a master black level camera control providing a master black level camera control signal, a system for maintaining the individual white levels from the camera when the master black level camera control is changed, comprising:

first means coupled to said master black level control for additively summing a first percentage of the master black level signal to each of the individual black level signals, and

second means coupled to said master black level control for subtracting a second percentage of the master black level signal from each of the individual white level signals to maintain the white levels when the master black level is charged.

4,218,700

LUMINANCE/CHROMINANCE SEPARATING APPARATUS HAVING A SPATIAL FILTERING EFFECT

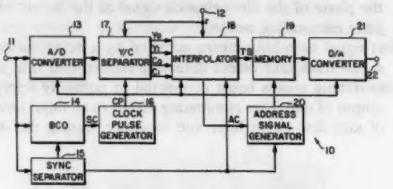
Kazuo Kashigi, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 15, 1979, Ser. No. 39,287

Claims priority, application Japan, May 17, 1978, 53-59164

Int. Cl.[2] H04N 9/535

U.S. Cl. 358—31 **6 Claims**



1. A luminance/chrominance separating apparatus for a composite color television signal including a luminance signal and carrier chrominance signal, said carrier chrominance signal being formed by modulating a subcarrier wave with chrominance information, the subcarrier frequency of said subcarrier wave being m/2 (m being an odd number) of the horizontal scanning frequency of said composite color television signal, said separating apparatus comprising:

first and second series connected delay means for respectively providing a delay for said composite color television signal, the delay time of each of said first and second delay means being equal to one horizontal scanning period of said composite color television signal, said first and second delay means producing first and second delayed signals, respectively;

means for applying said composite color television signal to an input of said first delay means as a non-delayed signal;

first adding means for adding said non-delayed signal to said second delayed signal to produce a first added signal;

second adding means for adding said first delayed signal to said first added signal to produce a second added signal;

means for subtracting said first added signal from said first delayed signal to produce a subtracted signal;

means for extracting a low frequency signal component from said subtracted signal;

variable attenuator means for attenuating said low-frequency signal component; and

third adding means for adding an output signal of said variable attenuator to said second added signal.

4,218,701

PACKAGE FOR AN INTEGRATED CIRCUIT HAVING A CONTAINER WITH SUPPORT BARS

Yuzo Shirasaki, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

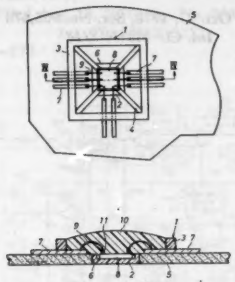
Filed Jul. 24, 1978, Ser. No. 927,723

Int. Cl.[2] H01L 23/28, 23/48, 29/44

U.S. Cl. 357—72 **4 Claims**

1. An integrated circuit package structure comprising in combination a circuit board having an aperture therein, an integrated circuit holder secured to said circuit board comprising an integrated circuit container, a frame surrounding said container, and bars for connecting said container to said frame, said container being inserted into the aperture of said circuit board such that the undersides of said frame and said bars are pressed against the surface of said circuit board and the upper surface of said container is coplanar with the surface of said circuit board, an integrated circuit chip provided in said con-

tainer having terminal electrodes wire-bonded to corresponding lead electrodes on said circuit board and a plastic potting



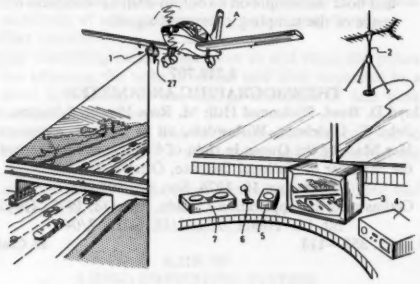
compound confined within said frame coating the electrically connected integrated circuit chip.

4,218,702

MEANS FOR REMOTE CONTROL OF AN AIRCRAFT VIDEO SYSTEM FOR SURVEYING GROUND ACTIVITY

François Brocard, Paris; André Denizot, Le Perreux, and Marcel Dif, Orsay, all of France, assignors to Societe Nationale Industrielle, Paris, France

Filed May 12, 1978, Ser. No. 905,605
Claims priority, application France, May 18, 1977, 77 15221
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—109 **5 Claims**



1. An aircraft video system utilizing an aircraft and operation on board intended for air surveyance of ground activity comprising

a technical container attached to the aircraft,

a transparent radome forming a forward portion of said container,

a pilot camera inclinable in angle of sight and azimuth located in said radome,

a television monitor screen in the aircraft connected to said camera,

a remotely controlled inclination means for controlling inclination and for controlling the object-lens of said camera in said radome connected to said camera,

a television transmitter with its transmission aerial in a rearward portion of said container,

said remotely controlled means including

a structure secured to said container through damping means,

a cradle connected to said structure,

a first means for pivoting said camera in azimuth with respect to said cradle,

a second means for pivoting in sight said cradle with respect to said structure,

electric motors having pulleys with two directions of rotation connected to further pulleys linked to said camera, and said electric motors also connected through cables to said cradle,

a remote-control box connected to said remotely controlled means located to be acted upon by instinctive reaction of the operator while observing said television monitor screen,

said remote-control box including

a pivoted axis shaft pivoted in an elastic block,

four microswitches controlling said electric motors for controlling camera inclination,

said shaft having a lower portion which acts upon said microswitches,

a plate in said box having a psuedo-square opening therein,

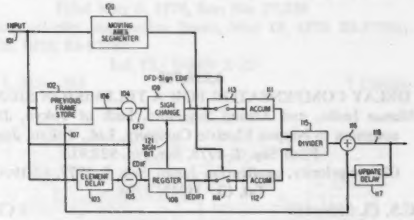
said lower portion of said shaft having protuberant parts on either side of a portion of said shaft itself included in said psuedo-square opening to prevent undesired action on said microswitches by allowing only limited deviations of said shaft.

4,218,703

TECHNIQUE FOR ESTIMATION OF DISPLACEMENT AND/OR VELOCITY OF OBJECTS IN VIDEO SCENES

Arun N. Netravali, Matawan, and John D. Robbins, Aberdeen, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 16, 1979, Ser. No. 21,063
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—136 **19 Claims**



1. Apparatus for generating an estimate of the displacement of an object in a video scene occurring between a prior frame and a present frame, comprising:

means for calculating a first estimate of displacement using the difference in picture intensity between at least one picture element in said present frame and a spatially corresponding picture element in said previous frame,

characterized by

means for recursively updating said first displacement estimate using the intensity difference between said at least one picture element in said present frame and a location in said previous frame displaced from said corresponding picture element by said first displacement estimate.

4,218,704

METHOD AND APPARATUS FOR VIDEO SIGNAL ENCODING WITH MOTION COMPENSATION

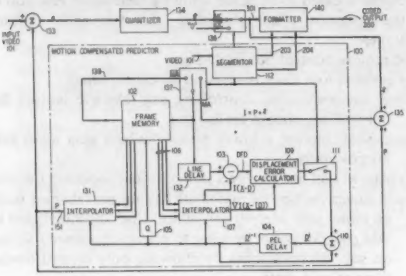
Arun N. Netravali, Matawan, and John D. Robbins, Aberdeen, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 16, 1979, Ser. No. 21,071
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—136 **20 Claims**

1. Apparatus for encoding a video signal representing the intensity values of a plurality of picture elements including,

means (100) for predicting the intensity values of picture elements in a present frame of said signal using estimates

of displacement of objects in said picture between said present frame and a prior frame,
wherein said apparatus is characterized by



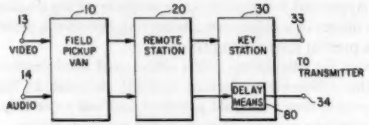
(1) means (104) for storing an initial estimate of said displacement, and
(2) means (109) responsive to said storing means for repeatedly updating said stored estimate.

4,218,705

DELAY COMPENSATOR FOR A TELEVISION SIGNAL

Masao Inaba, and Atsumi Sugimoto, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sep. 1, 1978, Ser. No. 938,913
Claims priority, application Japan, Sep. 5, 1977, 52-107012
Int. Cl.² H04N 5/04
U.S. Cl. 358—149 **3 Claims**



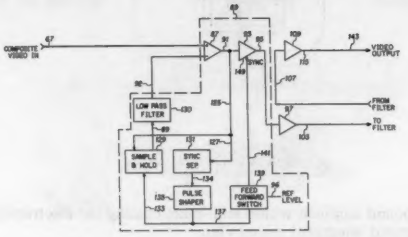
1. A delay compensator for a video signal component of a television signal transmitted through a video transmission path, the video signal being separate in part from an audio transmission path for an audio signal component of said television signal, said video transmission path comprising a plurality of frame synchronizers connected in series, each of said frame synchronizers comprising memory means having the capacity for temporarily delaying one field period of said video signal, said video signal being written in and read out of said memory means of each of said frame synchronizers, said system comprising;
delay means provided on said audio transmission path for delaying said audio signal by a period equal to a multiple m of one half of one field period, m being an integer, and
means for selecting said integer m in order to substantially equalize the audio signal delay caused by said delay means to one half of the maximum of predetermined total video signal delay caused by said plurality of frame synchronizers.

4,218,706

VIDEO CLAMP

Bill W. Brinegar, Garland, Tex., and John W. Haines, Tempe, Ariz., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 27, 1978, Ser. No. 955,670
Int. Cl.² H04N 5/18
U.S. Cl. 358—172 **10 Claims**



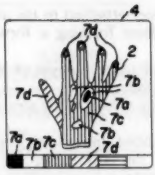
1. A video clamp means, comprising:
an input amplifier for obtaining a difference signal that is the algebraic difference between an input signal having periodically spaced synchronization pulses of a fixed synchronization period and a reference signal; and
means for generating a sampling command signal from the difference signal during the synchronization periods; and
means for sampling the difference signal upon the occurrence of each sampling command signal whereby the means for sampling the difference signal will generate the reference signal by taking a sample of the difference signal and hold the sample on its output until a subsequent occurrence of the sampling command signal.

4,218,707

THERMOGRAPHIC AREAMETER

Lloyd D. Reed, Richmond Hill; M. Ross Howat, Islington, and John E. Ulrichsen, Willowdale, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Apr. 10, 1978, Ser. No. 895,068
Claims priority, application Canada, May 13, 1977, 278419
Int. Cl.² H04N 7/33, 7/18; G01K 7/04
U.S. Cl. 358—113 **18 Claims**

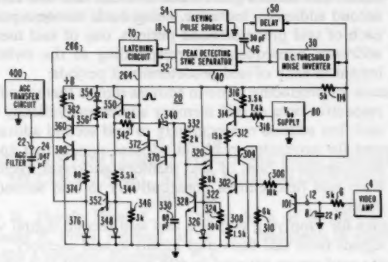


1. An area meter for a video thermographic display having a scan field comprising means for defining a predetermined area within said scan field and means for determining and displaying a numerical representation of a proportional area of said predetermined area relative to the total area of the scan field.

4,218,708
KEYED AGC CIRCUIT

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,823
Int. Cl.[2] H04N 5/52
U.S. Cl. 358—178 11 Claims



1. In an automatic gain control circuit of the type which is responsive to the level of synchronizing signal components of a composite video signal for developing an automatic gain control voltage, including means for supplying a composite video signal having synchronizing signal components, and a source of recurrent pulses normally in time coincidence with said synchronizing signal components; an automatic gain control voltage generator comprising:

a peak detector having an input circuit responsive to said composite video signal and an output circuit including a peak detecting capacitor which is charged to the peak amplitude of said synchronizing signal components;

a filter capacitor;

signal translating means responsive to said recurrent pulses for adjusting the voltage across said filter capacitor to a level determined by the charge condition of said peak detecting capacitor;

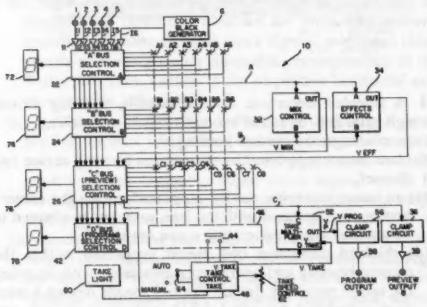
means, independent of said filter capacitor and coupled to said peak detector, for discharging said peak detecting capacitor; and

means responsive to said recurrent pulses for disabling said discharging means.

4,218,709
VIDEO SWITCHING SYSTEM

Larry K. Baxter, Lexington, and A. Donald Brickman, Andover, both of Mass., assignors to Echolabs, Inc., Burlington, Mass.

Filed Oct. 5, 1977, Ser. No. 839,664
Int. Cl.[2] H04N 5/22
U.S. Cl. 358—181 20 Claims



1. A switching system for video signals comprising:

A. a plurality of inputs for receiving a corresponding plurality of input video signals, including a current video signal;

B. a preview output and a program output, said preview output being adapted for connection to a preview video monitor;

C. preview selection means for selecting one of a plurality of inputs and for placing the input video signal associated with the selected input onto a preview bus, said preview bus carrying the selected signal to said preview output;

D. program connection means for connecting the input associated with the current video signal to a program bus;

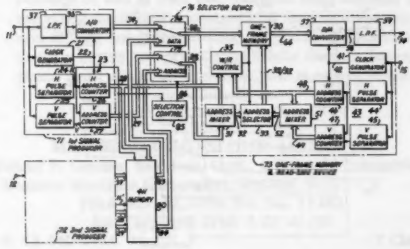
E. a take switch;

F. take control means including a first input connected to said preview bus, a second input connected to said program bus, an output connected to said program output, said take control means generating an output video signal corresponding to the video signal on the program bus prior to activation of said take switch, and, after activation of the take switch, generating an output video signal corresponding to the video signal on the preview bus, the program connection means being responsive to said take control means to connect the input associated with the preview bus video signal to the program bus, the take control means thereafter generating an output signal corresponding to the program bus video signal.

4,218,710
DIGITAL VIDEO EFFECT SYSTEM COMPRISING ONLY ONE MEMORY OF A CONVENTIONAL CAPACITY

Kazuo Kashigi, and Toshitake Koyama, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 8, 1979, Ser. No. 37,238
Claims priority, application Japan, May 15, 1978, 53-57781; May 15, 1978, 53-57782
Int. Cl.[2] H04N 5/22
U.S. Cl. 358—183 7 Claims



1. In a digital video effect system responsive to a plurality of individually synchronized input television signals and a reference timing signal comprising horizontal and vertical synchronizing pulses as said television signals do, for producing a mixed television signal phase-locked to said timing signal and representing a picture composed of predetermined areas of the respective pictures represented by said input television signals, said system comprising address signal producing means responsive to said input television and said timing signals for producing corresponding sequences of horizontal and vertical address signals with the horizontal and the vertical address signals of each sequence synchronized with the horizontal and the vertical synchronizing pulses of the corresponding one of said input television and said timing signals, converter means operatively coupled to said address signal producing means for converting said input television signals to corresponding sequences of digital video signals with the video signal sequences thus made to correspond to first ones of said address signal sequences that correspond to said input television signals and with the digital video signals of each video signal sequence synchronized with the horizontal address signals of the corresponding one of said first sequences, and memory means hav-

ing a plurality of addresses for memorizing the digital video signals of said video signal sequences in the memory means addresses specified by the horizontal and the vertical address signals of said first sequences and for producing the digital video signals memorized in the memory means addresses specified by the horizontal and the vertical address signals of a second one of said address signal sequences that corresponds to said timing signal to derive said mixed television signal, the improvement wherein said memory means comprises:

mixing means responsive to the horizontal address signals of a prescribed one of said first and said second sequences for mixing the digital video signals of said video signal sequences and the vertical address signals of said first sequences into mixed digital video and vertical address signals phase-locked to the horizontal address signals of said prescribed sequence and composed of the digital video signals of said video signal sequences and the vertical address signals of said first sequences; and

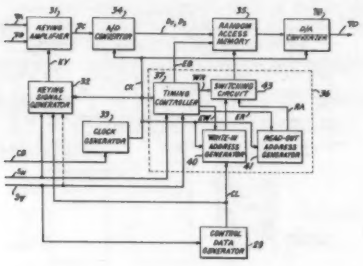
a memory having a plurality of memory addresses for memorizing said mixed digital video signals in the memory addresses specified by the horizontal address signals of said prescribed sequence and said mixed vertical address signals and for producing the mixed digital video signals memorized in the memory addresses specified by the horizontal and the vertical address signals of said second sequence to derive said mixed television signal.

4,218,711

SPECIAL EFFECT DEVICE FOR ELECTRONICALLY ACCOMPLISHING A GRADUAL SCENE SHIFT

Kazuo Kashigi, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 11, 1979, Ser. No. 38,129
Claims priority, application Japan, May 12, 1978, 53/56757
Int. Cl.[2] H04N 5/22
U.S. Cl. 358—183 **1 Claim**



1. A special video effect device for electronically accomplishing a special video effect in response to first and second video signals phase-locked to each other, including switching signal producing means operable during a predetermined interval of time substantially equal to a plurality of predetermined periods for producing a switching signal indicative of a switching instant variable between the beginning and the end of each of said predetermined periods and a keying circuit responsive to said first and said second video signals and said switching signal for keying said first and said second video signals to produce a third video signal that comprises a predetermined one of said first and said second video signals alone before said predetermined interval, repeatedly said first and said second video signals between the beginnings and the switching instants of the respective ones of said predetermined periods and between the switching instants and the ends of the respective ones of said predetermined periods, respectively, and the other of said first and said second video signals alone after said predetermined interval, wherein the improvement comprises:

converter means coupled to said keying circuit for converting said third video signal to a sequence of digital video signals with said first and said second video signals, those contained in said third video signal inclusive, converted to first and second digital video signals, respectively;

a random access memory having a plurality of memory addresses specifiable by numbers corresponding to consecutive integers starting at a first of said memory addresses and ending at a second of said memory addresses in a predetermined one of an ascending and a descending order, said memory addresses between said first and said second addresses, inclusive, being made to correspond to each of said predetermined periods, one of said memory addresses consequently corresponding to the switching instant in each of said predetermined periods;

means for producing write-in address signals that specify the respective ones of said memory addresses cyclically from said first address consecutively to said second address;

means for producing read-out address signals that specify the respective ones of said memory addresses cyclically from said first address consecutively to said second address;

means for supplying said first and said second digital video signals from said converter means to said memory;

write-read means coupled to said memory and said write-in and said read-out address signal producing means for making said memory memorize said first and said second digital video signals in the memory addresses specified by the respective ones of said write-in address signals and produce an output signal comprising the first and the second video signals memorized in the memory addresses specified by the respective ones of said read-out address signals; and

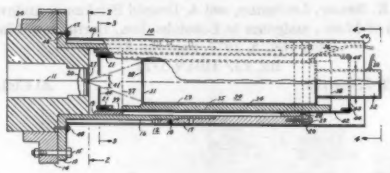
control means operatively coupled to said switching signal producing means and said write-in and said read-out address signal producing means for controlling a predetermined at least one of said write-in and said read-out address signal producing means to make the address signals produced by the predetermined address signal producing means start at said one address.

4,218,712

MAGNETICALLY SHIELDED IMAGE DISSECTOR TUBE CAMERA

John C. Clymer, and Nikoli Eberhardt, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 17, 1977, Ser. No. 778,512
Int. Cl.[2] H04N 5/00
U.S. Cl. 358—229 **1 Claim**



1. A shielded electronic camera capable of being moved through axial and/or radial magnetic fields, comprising:

(a) a nonmagnetic camera housing,

(b) lens means supported by the camera housing at one end thereof,

(c) an image receiving device supported within the camera housing in alignment with the lens, said device adapted to be scanned while generating a camera signal,

(d) shielded deflection coil means supported within the camera housing and operatively associated with scanning the image receiving device, the coil means having a standard cylindrical mu metal shield enclosing just coils and terminating at fully open front and rear ends adjacent coil ends to attenuate essentially a radial magnetic field,

(e) the standard cylindrical mu metal shield modified by axially extending cylindrical mu metal shielding means beyond at least one of the standard shield ends to attenuate an axial magnetic field, and

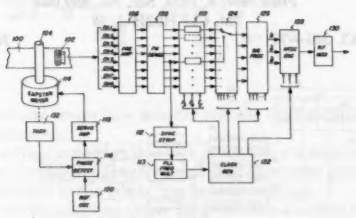
(f) the axially extending cylindrical mu metal shielding means is adapted to include first and second mu metal end closure means, the first said end closure means having an optical opening therein adjacent to the lens, and the second said end closure means having an access opening at an end opposite the lens.

4,218,713

APPARATUS FOR CORRECTING TIME BASE ERROR IN A MULTICHANNEL, SAMPLED-ANALOG VIDEO SIGNAL

Jerry R. Horak; Peter L. P. Dillon, both of Rochester, and Ronald R. Firth, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,268
Int. Cl.² H04N 5/79
U.S. Cl. 360—36 **10 Claims**



1. In apparatus for reproducing a sampled-analog type video signal recorded in a plurality of tracks on a magnetic recording medium, the signal portion in each track containing horizontal synchronization information, the apparatus including an essentially-fixed multichannel playback head and means for moving the recording medium relative to the head at a controlled rate to reproduce the signal portion recorded in each track, and a plurality of channels for carrying the reproduced signal portions, a time base correcting circuit for reproducing the signal portions without substantial high frequency flutter and without substantial skew or scatter between the respective signal portions, said circuit comprising:

(a) means for producing a substantially constant frequency output clock signal;

(b) means responsive to the horizontal synchronization information in respective channels for producing a corresponding plurality of input clock signals, said input clock signals possessing flutter distortion corresponding to the flutter distortion present in the respective horizontal synchronization information;

(c) a plurality of deflutter buffers, one buffer per signal portion, each of said buffers including input shift register means for receiving a reproduced signal portion under control of the respective input clock signal, means for storing said signal portion for a period of time, and output shift register means for delivering said signal portion; and

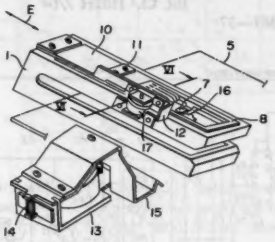
(d) means for feeding said output clock signal to all of said output shift register means to cause said output shift register means to synchronously deliver the signal portions without substantial high frequency flutter and without substantial skew or scatter between the respective signal portions.

4,218,714

DOUBLE SIDE TYPE FLEXIBLE MAGNETIC DISC DRIVE APPARATUS

Shin Isozaki, and Kanji Sakurai, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1978, Ser. No. 952,191
Claims priority, application Japan, Oct. 24, 1977, 52-127384
Int. Cl.² G11B 5/016, 5/55, 21/12
U.S. Cl. 360—99 **4 Claims**



1. In a double side type flexible magnetic disc drive apparatus having a structure such that at least one magnetic head is contacted with at least one surface of a flexible magnetic recording medium during recording and reading out and said at least one magnetic head is positioned a distance from said recording medium during a waiting period or exchanging of said recording medium, an improvement which comprises:

a head shifting mechanism;

a frame;

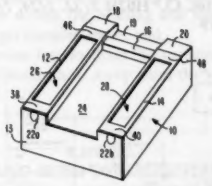
damper means for imparting a damping force substantially proportional to a shifting speed which interconnects said head shifting mechanism and said frame whereby shock of collision of said at least one magnetic head through said recording medium is decreased and associated bounce of said at least one magnetic head is decreased wherein said damper means comprises a hydraulic damper having a piston and cylinder with a small hole in said cylinder.

4,218,715

MAGNETIC HEAD SLIDER ASSEMBLY

Michael F. Garnier, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,952
Int. Cl.² G11B 5/60, 5/22, 21/20
U.S. Cl. 360—103 **7 Claims**



1. An air bearing head slider for supporting transducer elements comprising:

a support structure having an air bearing surface and a longitudinal axis along said surface, and leading and trailing edges;

side rails disposed along the side edges of said air bearing surface;

a cross-rail disposed between said side rails;

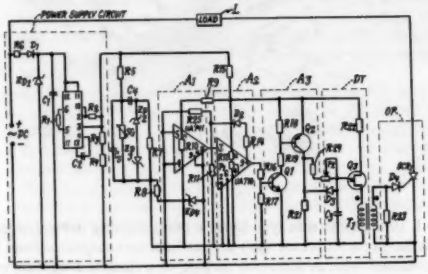
said side rails having relatively shallow recesses formed

therein, for yielding substantially ambient pressure across the rails, whereby said slider is insensitive to skew and disk curvature.

4,218,716
PROGRAMMABLE FAULT DETECTING RELAY FOR A TRANSFORMER

Joseph J. Narbus, Lindenwold, N.J., assignor to General Electric Company, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,289
Int. Cl.[2] H02H 7/04
U.S. Cl. 361—37 **5 Claims**



1. A programmable fault detecting relay for a transformer comprising;

transducer means for producing an output voltage in proportion to a pressure generated within the transformer;

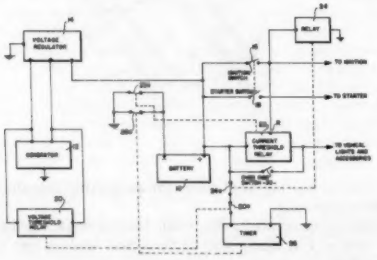
at least one operational amplifier connected to function as a voltage comparator and coupled with the transducer for sensing the voltage level generated by the transducer and comparing said level to a threshold for producing an output when said threshold is reached;

at least one unijunction transistor in an RC charging circuit coupled with an output of the operational amplifier and at least one variable resistor coupled with the transistor for providing adjustable time delay to the RC circuit for providing a time delay period between the time at which the threshold is first reached and a later time; and at least one thyristor coupled with the transistor for providing an output at the end of the delay period.

4,218,717
ELECTRIC CONTROL SYSTEM FOR MOTOR VEHICLE

Harry Shuster, 1430 Loma Vista Dr., Beverly Hills, Calif. 90210

Filed Aug. 21, 1978, Ser. No. 935,689
Int. Cl.[2] H02H 3/32, 3/24, 7/18
U.S. Cl. 361—79 **4 Claims**

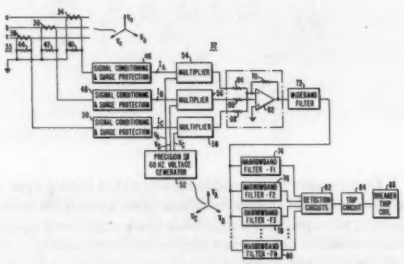


1. An electrical control system for connection into the electrical system of an automotive vehicle for controlling the connection between a source of electrical energy and at least one electrical energy consuming device in the vehicle, the electrical system of the vehicle including a battery and a generator together constituting said source of electrical energy, said electrical energy consuming device drawing excessive electric current from said source sufficient to discharge the battery when the generator is inoperative, and an ingnition switch for connecting said source to the ignition system of the vehicle; said control system including: a current sensative relay connected between said source and said electrical energy consuming device; a voltage sensitive relay connected across said generator; relay circuitry controlled by said current sensitive relay and by said voltage sensitive relay to terminate the excessive current flow to the energy consuming device in the event fthe current flow through the current sensitive relay exceeds a predetermined current threshold and when the voltage across the generator drops below a predetermined voltage threshold; a further relay connected to the ignition switch and having contacts connected in said relay circuitry for rendering said relay circuitry active only when the ignition switch is open; and timer means connected to said relay circuitry to render said relay circuitry effective only after a predetermined time interval.

4,218,718
PROTECTIVE RELAY APPARATUS

Shan C. Sun, Bell Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1978, Ser. No. 959,044
Int. Cl.[2] H02H 3/38
U.S. Cl. 361—79 **20 Claims**



1. Apparatus for providing output signals responsive to subsynchronous currents flowing in a three-phase electrical power system having a three-phase voltage generated at a synchronous power frequency, comprising:

first means providing three signals responsive to the currents flowing in the three phases of the three-phase electrical power system,

second means providing three reference signals, said reference signals being constant amplitude, synchronous frequency, sinusoidal three-phase signals,

multiplier means multiplying each of the current related signals of the first means by a different reference signal of the second means, to provide three output signals responsive to the products of the multiplied signals, said output signals each having first, second and third elements having frequencies responsive to (1) twice the synchronous frequency, (2) the sum of each subsynchronous frequency, and the synchronous frequency, and (3) the difference between the synchronous frequency and each subsynchronous frequency, respectively,

summing means summing the three output signals of said multiplier means to provide a summed signal, said summing means providing the positive sequence component of the three elements of the output signals of said multiplier means,

and filter means responsive to said summed signal, said filter means providing a subsynchronous current signal respon-

sive to the positive sequence component of a subsynchronous current flowing in the three-phase electrical power system.

4,218,719

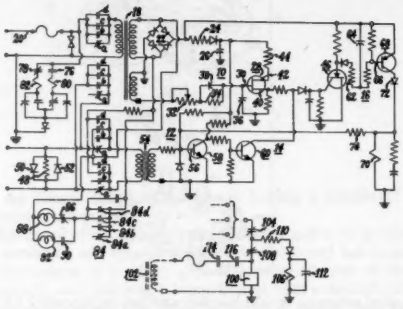
REVERSE POWER FLOW DETECTOR AND CONTROL CIRCUIT

Reysen Tsai, Houston, Tex., assignor to General Electric Company

Continuation of Ser. No. 427,511, Dec. 26, 1973, Pat. No. 4,121,271. This application Sep. 5, 1978, Ser. No. 939,713

Int. Cl.[2] H02H *3/38*

U.S. Cl. 361—82 **6 Claims**



1. A reverse power flow detector utilizing solid state components comprising:

(a) a voltage sampling circuit for generating a voltage signal, said circuit including a voltage reference pulse generator connected to the power line to be monitored;

(b) a current sampling circuit for generating a current signal,

(c) an output circuit; and,

(d) a single gate circuit operative between said voltage pulse generator and said output circuit, said single gate circuit comprising only one transistor;

(1) said one transistor being turned on by a current signal indicating forward power flow to short out pulses generated by said pulse generator, preventing said pulses from activating said output circuit, and

(2) said one transistor being turned off by a current signal indicating reverse power flow to allow pulses generated by said pulse generator to activate said output circuit.

4,218,720

TELEVISION RECEIVER PICTURE TUBE PROTECTION CIRCUIT

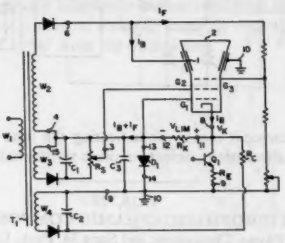
George H. Kam, Tonawanda, and John D. Lovely, Batavia, both of N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 22, 1979, Ser. No. 13,851

Int. Cl.[3] H02H *3/08*

U.S. Cl. 361—93 **6 Claims**

1. An improved protection circuit for a television receiver which is comprised in part of a pictorial display means having an anode terminal, a control-grid terminal and at least one cathode terminal; a source of reference potential; a d-c anode voltage supply means having first and second anode supply terminals wherein said first anode supply terminal is coupled to said anode terminal; a beam modulation means having at least first and second output terminals wherein said first output terminal is coupled to said cathode terminal and wherein said second output terminal is coupled to said reference potential, said first output terminal having an average value of voltage greater than said reference potential, said beam modulation means having a low-impedance direct-current path between said first and second output terminals; said protection circuit characterized by a unidirectional coupling means, having a forward terminal and a reverse terminal wherein said reverse terminal is coupled to said reference potential, and by a resistive means having first and second impedance terminals



wherein said first impedance terminal is coupled to said cathode terminal and wherein said second impedance terminal is coupled to said forward terminal, said second anode supply terminal and said grid terminal.

4,218,721

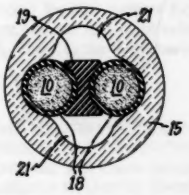
HEAT TRANSFER SYSTEM FOR VOLTAGE SURGE ARRESTERS

Earl W. Stetson, Pittsfield, Mass., assignor to General Electric Company, N.Y.

Filed Jan. 12, 1979, Ser. No. 2,858

Int. Cl.[2] H02H *9/04*

U.S. Cl. 361—117 **12 Claims**



1. A heat transfer arrangement for voltage surge arresters comprising:

an electrically insulated housing having a passageway extending there through and defined by a dual radius configuration, the first radius conforming to the radius of a zinc oxide varistor within the housing and the second radius providing a gas transfer space; and

heat transfer means intermediate the varistor and a housing wall for conducting heat away from the varistor into the housing wall.

4,218,722

COMPACT HAND-HELD DEMAGNETIZING DEVICE

Keiichi Yoshizawa, Chiba, Japan, assignor to TDK Electronics Company Limited, Tokyo, Japan

Filed Nov. 1, 1978, Ser. No. 956,774

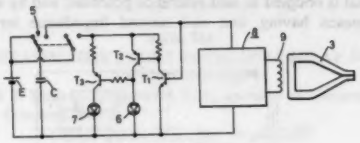
Claims priority, application Japan, Sep. 8, 1978, 53-122718[U]

Int. Cl.[2] H01F *13/00*

U.S. Cl. 361—149 **8 Claims**

1. A compact hand-held demagnetizing device including a circuit contained in a handle portion for generating a decreasing alternating electric current, a drive coil excited by said current, a demagnetizing head extending from said handle portion and driven by said drive coil for generating a decreasing alternating demagnetizing magnetic field, and a manually

operable switch for initiating the generation of said decreasing alternating current, characterized in that said device includes



first luminescent means for indicating the time when the decreasing alternating current becomes substantially zero level.

4,218,723

HETEROPHASIC CERAMIC COMPOSITION

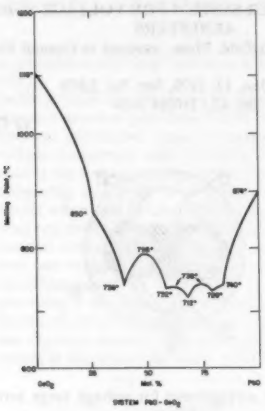
David A. Payne, Champaign, and Sang M. Park, Urbana, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 847,588, Nov. 1, 1977, Pat. No. 4,158,219. This application Mar. 26, 1979, Ser. No. 24,099

The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.

Int. Cl.[2] C04B *35/00, 35/46*

U.S. Cl. 361—321 **3 Claims**



1. A heterophasic ceramic composition consisting essentially of a major amount of barium titanate and from about 1 to about 33 volume % of a lead germanate composition having the formula

$$(PbO)_x(GeO_2)_{y-z}(SiO_2)_z$$

where $1<x\leqq 6$, y ranges from 1 to 3, and the sum of $y+z$ is $\leqq 3$, the ceramic composition being characterized in that densification is effected by liquid phase sintering at a temperature in the range of from about 750° to about 1050° C. to yield the heterophasic structure in which the lead germanate composition provides a continuous intergranular phase which separates the barium titanate phase into discrete localized volumes.

4,218,724

COMPACT CIRCUIT PACKAGE HAVING IMPROVED CIRCUIT CONNECTORS

Lance R. Kaufman, 131 White Oak Way, Mequon, Wis. 53092

Filed Nov. 21, 1978, Ser. No. 962,588

Int. Cl.[2] H05K *1/14*

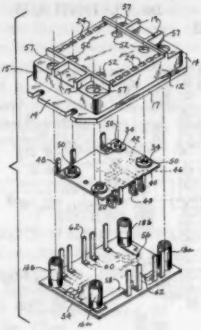
U.S. Cl. 361—395 **11 Claims**

1. A circuit package comprising:

a housing having a base plate surrounded by a peripheral wall to form a circuit receiving receptacle;

a first substrate positioned in said receptacle with one side adjacent the interior side of said base plate and the other side containing electrical circuitry, said substrate having a first set of electrical leads comprising sheet-like lead frame extensions extending from said substrate;

a second substrate positioned in said receptacle adjacent the rim of said peripheral wall and closing the receptacle of said housing, said second substrate being spaced from said



first substrate in said housing and having circuitry on the side facing said first substrate, said second substrate having a second set of leads comprising sheet-like lead frame extensions extending from said substrate; and

a plurality of recessed cells in said base plate extending through said base plate and opening on the exterior side thereof, selected leads of said first and second sets positioned within and surrounded by selected ones of said recessed cells to engage external connector means inserted in said cells for interconnection within external electrical circuits.

4,218,725

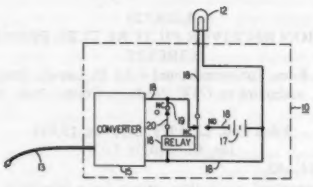
EMERGENCY LIGHT

Ronald J. Heffner, 370 Rte. 22, Greenbrook, N.J. 08812, and Russell Lee, 3 Patrick St., Carteret, N.J. 07008

Filed Jan. 15, 1979, Ser. No. 3,206

Int. Cl.[2] F21V *19/04*

U.S. Cl. 362—20 **7 Claims**



1. An emergency lighting unit comprising:

a light assembly having at least one bulb rated at low voltage;

converter means for transforming line voltage to said low voltage;

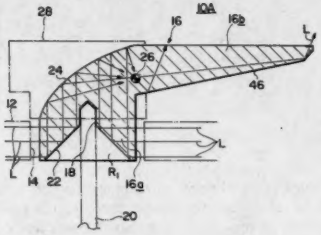
battery means having a potential equal to said low voltage;

relay means for connecting the low voltage of said converter means to said bulb when energized and for connecting the low voltage of said battery to said bulb when de-energized, said relay means being normally energized when line voltage is applied to said converter means;

4,218,726
INDICATOR GAUGE WITH ILLUMINATED POINTER

Noburu Fukasawa, Kamakura, and Masao Ishikawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 6, 1978, Ser. No. 957,761
Claims priority, application Japan, Nov. 9, 1977, 52/134945
Int. Cl.[2] G01D 11/28; B60Q 1/26; F21V 7/04
U.S. Cl. 362—23 21 Claims



1. An illuminated indicator gauge having a spindle of a movement, comprising:

a dial board of a transparent material arranged to be perpendicular to said spindle so that said dial board has longer dimensions in a plane generally perpendicular to said spindle, said dial board being formed with a through hole through which said spindle spacedly passes, said dial board having a periphery;

illuminating means located at the periphery of the dial board such that the light rays from the illuminating means are transmitted entirely within the transparent material of said dial board in a direction which is towards the through hole and which is parallel to the longer dimensions of the dial board;

an indicator pointer of a transparent material including a hub section fixed to said spindle, an elongate pointing section radially outwardly extending from said hub section and a joint section between said hub section and said pointing section, whereby said pointer moves over the face of said dial board in response to rotation of said spindle about the axis of said spindle, said hub section being formed with a front section from which said pointing section extends and a rear section which is located adjacent said through hole of said dial board said pointing section having a free end opposite said joint section;

first light reflecting means located in the vicinity of said through hole of said dial board for reflecting the light rays, which come through said dial board from said illuminating means, toward said front section of said hub section; and

second light reflecting means formed on said front section for reflecting the light rays from said first light reflecting means toward the pointing section of said pointer, wherein said second light reflecting means is a curved surface which is shaped and disposed to have at least one focus within an area of said indicator pointer, said area extending from the joint section of said hub section and said pointing section to a free end of said pointing section.

4,218,727
LUMINAIRE

Sylvan R. Shemitz, Woodbridge, and Benjamin L. Stahlheber, Clinton, both of Conn., assignors to Sylvan R. Shemitz and Associates, Inc., West Haven, Conn.

Filed Jul. 3, 1978, Ser. No. 921,839
Int. Cl.[2] F21V 7/00
U.S. Cl. 362—297 10 Claims

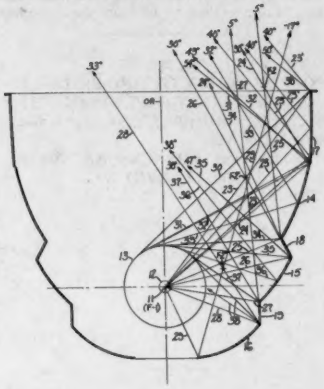
1. In a luminaire, the combination of:

a light source in an envelope;

a plurality of reflecting elements disposed symmetrically with respect to an optical axis passing through the light source, said elements including,

a first reflector adapted to reflect rays from the light source into a zone of about 5° from the optical axis to about 30° to 40° from the optical axis,

a second reflector adapted to reflect rays from the light source into a zone of about 5° from the optical axis to about 30° to 40° from the optical axis,



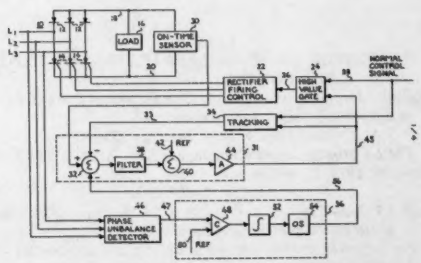
a third reflector adapted to reflect rays from the light source into a zone of about 15° to 17° on one side of the optical axis to about 36° on the other side of the optical axis, and a fourth reflector adapted to reflect rays from the light source into a zone of about 40° from the optical axis,

said forth reflector being located farthest from the light source and said first, second and third reflectors being located successively closer to the light source.

4,218,728
POLYPHASE HYBRID RECTIFYING BRIDGE WITH COMMUTATION FAULT PROTECTION

George S. Chambers, Daleville, and Carter Sinclair, Waynesboro, both of Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 18, 1978, Ser. No. 970,428
Int. Cl.[2] H02H 7/125
U.S. Cl. 363—54 8 Claims



1. For use with a polyphase rectifying bridge supplying a load, said bridge including controlled rectifiers, a circuit for preventing commutation failure of the controlled rectifiers comprising:

(a) means to sense time periods during which a voltage exists across said load and to develop a time signal proportional thereto;

(b) means to provide a reference signal proportional to a minimum period of time during which voltage should exist across said load in order to prevent commutation failure; and,

(c) means to compare said time signal and said reference signal and to produce an output signal in response to a prescribed relationship therebetween, said control signal selectively serving to override a normal control signal acting to govern the operation of the controlled rectifiers of said bridge to thereby increase their conduction time.

4,218,729

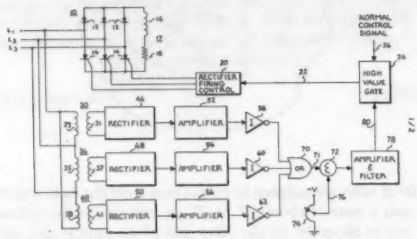
POLYPHASE RECTIFYING BRIDGE WITH COMMUTATION FAULT PROTECTION

George S. Chambers, Daleville, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 18, 1978, Ser. No. 970,429

Int. Cl.² H02H 7/125

U.S. Cl. 363—54 **11 Claims**



1. For use with a polyphase rectifying bridge having at least one controlled rectifier associated with each phase and means for phase controlling said rectifiers to thereby control the power supplied from a source of alternating current power to a load connected to the bridge, a circuit for avoiding commutation failure of said rectifiers comprising:

(a) timing means for determining the time periods during which commutation of each of said rectifiers occurs and to provide an output signal representative thereof;

(b) means to provide a reference signal representing a predetermined value to which phasing back of said control rectifiers is limited;

(c) means to combine said output signal and said reference signal to provide an overriding control signal; and,

(d) means selectively responsive to said overriding control signal to advance the firing angle of the rectifiers of the bridge.

4,218,730

TRANSISTOR SWITCHING APPARATUS FOR USE IN THE CONTROL OF A D.C. LOAD

Katsuji Marumoto, and Tsutomu Ohmae, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 9, 1978, Ser. No. 959,099

Claims priority, application Japan, Nov. 9, 1977, 52-133462; Nov. 30, 1977, 52-142780

Int. Cl.² H02M 7/00

U.S. Cl. 363—124 **11 Claims**

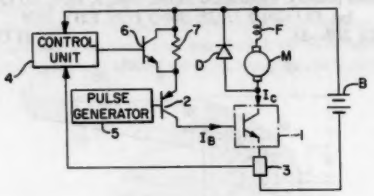
1. A transistor switching apparatus comprising:

(a) a power switch transistor having a base, emitter and collector with its emitter-collector path connected in series with a D.C. power source and a load, said transistor operating alternatively in a saturation state and a cut-off state of its emitter-collector conduction for converting D.C. power to A.C. power delivered to said load;

(b) a current detector for detecting an electric current flowing through the emitter-collector path of said power switch transistor;

(c) a controllable impedance element connected between said base of the power switch transistor and the D.C. power source; and

(d) a control unit coupled to the controllable impedance element to receive the current detected by the current detector and to cause a change in value of said controllable impedance element in response to said detected current so as to vary the base current to the power switch transistor as substantially the inverse function of a characteristic curve of a D.C. amplification factor versus collector current of said power switch transistor.



4,218,731

INVERTER COMPRISING AT LEAST TWO CONTROLLABLE LOAD THYRISTORS

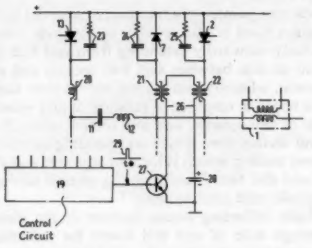
Werner Kiehnel, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,366

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731938

Int. Cl.² H02M 7/515

U.S. Cl. 363—136 **2 Claims**



1. An inverter comprising at least two controllable load thyristors to which a control circuit is connected which alternately switches them on for the purpose of alternate connection of a load to the poles of a dc voltage source, wherein one diode each is connected in antiparallel fashion to each load thyristor, said diode being a component of a commutation installation for the corresponding load thrysitor which commutation installation manifests an LC-series oscillatory circuit dimensioned for a specified load current, and a controllable commutation thyristor, connected to the control circuit for each load thyristor, whereby each commutation thyristor forms a closed circuit with the LC-series oscillatory circuit and its diode, such that the energy of the LC-series oscillatory circuit, during commutation, in each instance swings over to a low-impedance commutation path which is free of the load and the dc voltage source, characterized in that one saturable choke each (e.g. **20, 21, 22**) is connected in series with each thyristor (**2** through **5, 13, 14, 17, 18**) and each diode (**7** through **10**), that one RC-element each (e.g. **23, 24, 25**) is connected in parallel with each thyristor (**2** through **5, 13, 14, 17, 18**) and each diode (**7** through **10**), and that saturation means (e.g. **26, 27, 28**) are provided for the chokes (e.g. **21, 22**) of the diodes (**7**

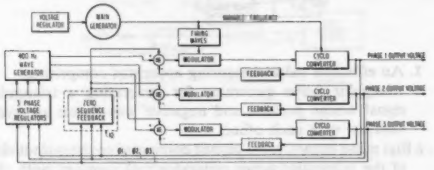
through 10) and load thyristors (2 through 5), said saturation means being controlled by the control circuit (19) for driving the chokes (e.g. 21, 22) of the diodes and load thyristors into saturation when the current flowing through the corresponding load thyristor (e.g. 2) becomes zero.

4,218,732

PHASE ANGLE BALANCING CIRCUIT FOR A VARIABLE SPEED CONSTANT FREQUENCY POWER SYSTEM

David L. Lafuze, Endicott, N.Y., assignor to General Electric Company, Wilmington, Mass.

Filed Nov. 6, 1978, Ser. No. 957,909
Int. Cl.[2] H02M 5/257
U.S. Cl. 363—160 **17 Claims**



1. A cycloconverter of the type having a source of multiphase electric power, a plurality of cycloconverter power source means connected to such multiphase electric power, each said cycloconverter power source means responsive to a gating signal for providing one of a plurality of alternating current power signals, of a preselected frequency, first means responsive to each of said alternating current power signals for providing a plurality of reference signals of said preselected frequency having voltage amplitudes controlled in accordance with voltage levels of said alternating current power signals, a plurality of gating signal means, each of said gating signal means having an input responsive to one of said reference signals for providing said gating signal to one of said cycloconverter power source means, the improvement comprising:

second means responsive to each of said alternating current power signals for summing said alternating current power signals so as to produce a zero sequence voltage signal, for inverting said zero sequence voltage signal, for providing said inverted zero sequence voltage signal to the input of said gating signal means.

4,218,733

ADAPTIVE GAIN CONTROLLER

Stephen A. Maselli, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

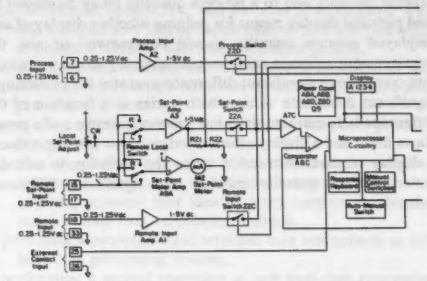
Filed Nov. 13, 1978, Ser. No. 959,498
Int. Cl.[2] G06G 7/66; G05B 13/02
U.S. Cl. 364—105 **7 Claims**

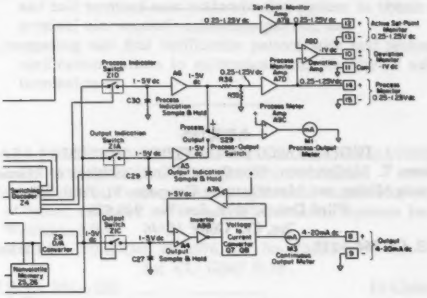
1. A controller for closed loop control of a process, said controller having the ability to change its active gain to compensate for process non-linearity so as to maintain a substantially constant closed loop gain, and being comprised of:

a plurality of inputs for receiving signals representing variables;

computing means for transforming said signals into corresponding active gain factors and for computing the active gain of the controller as a function of the product fo the active gain factors; and

means for translating the calculated active gain to an output signal;





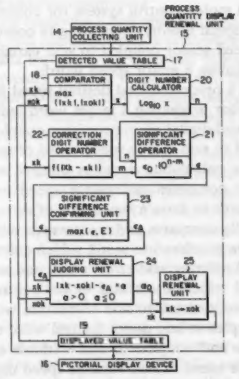
wherein at least one of said variables has a corresponding active gain factor defined by a first corresponding gain factor, a breakpoint, and a second corresponding gain factor.

4,218,734

PROCESS QUANTITY DISPLAY APPARATUS

Masayuki Ito, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 29, 1978, Ser. No. 937,850
Claims priority, application Japan, Sep. 2, 1977, 52/104782
Int. Cl.[2] G06F 15/46
U.S. Cl. 364—118 **8 Claims**



1. In process quantity display apparatus of a plant, comprising a detector for detecting a plurality of process quantities of said plant, a process quantity collecting unit for collecting the

process quantities detected by said detector, a pictorial display means for displaying said detected process quantities, and a process quantity display renewal unit responsive to a detected process quantity and to a process quantity being displayed by said pictorial display means for judging whether display of said displayed process quantity should be renewed or not, the improvement wherein said process quantity display renewal unit comprises a significant difference operator for providing a significant difference value which varies as a function of the difference between said detected process quantity and a preset alarm limit, and a display renewal judging unit which produces a display renewal instruction when the variation in said detected process quantity exceeds said significant difference value.

4,218,735

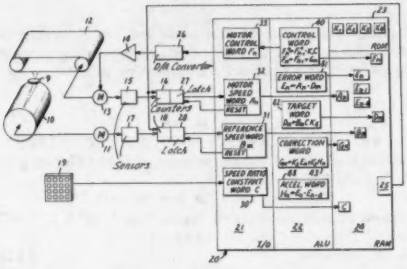
DIGITAL MOTOR CONTROL SYSTEM

James T. McCutcheon, Woodbury, Minn., assignor to Minnesota Mining and Manufacturng Company, St. Paul, Minn.

Filed Oct. 5, 1978, Ser. No. 948,829

Int. Cl.[2] G06F *15/46*

U.S. Cl. 364—118 **3 Claims**



1. A digital motor control system for controlling the speed of a variable speed motor, comprising in combination:

a motor speed sensor coupled to said variable speed motor and producing a motor speed word;

an input of a predetermined desired speed for said variable speed motor producing a target word indicative thereof;

a programmed digital microprocessor coupled to said target word and to said motor speed word of said motor speed sensor for calculating a motor control word which sequentially compares said motor speed words with said target words to form a succession of error words, which sequentially compares said error words with each other to develop an acceleration word, which calculates a correction word utilizing said error words and said acceleration word and which alters said motor control word by an amount proportional to said correction word; and

a driver coupled to said motor control word of said calculating means and coupled to said variable speed motor to control the speed of said variable speed motor responsive to said motor control word;

such that the speed of said variable speed motor converges with said predetermined desired speed for said variable speed motor.

4,218,736

EFFECTIVE VALUE MEASURING APPARATUS

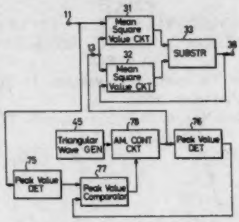
Hirofumi Haraguchi, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Mar. 23, 1979, Ser. No. 23,457

Claims priority, application Japan, Apr. 3, 1978, 53-38953; Apr. 3, 1978, 53-38954

Int. Cl.[2] G01R *29/00*; G06G *7/62*

U.S. Cl. 364—483 **11 Claims**



1. An effective value measuring apparatus comprising:

a triangular wave generator for generating a triangular signal whose positive and negative waveforms are symmetrical with each other;

a first mean square value circuit connected to the output side of the triangular wave generator and supplied with the triangular signal and a signal to be measured for adding these signals into a composite signal, full-wave rectifying the signal and smoothing the rectified signal;

a second mean square value circuit connected to the output side of the triangular wave generator and supplied with the triangular signal and a measured output signal for adding these signals into a composite signal, full-wave rectifying the signal and smoothing the rectified signal; and

a subtractor connected to the output sides of the first and second mean square value circuits for subtracting their outputs one from the other, supplying the subtracted output to a measured output terminal and applying the subtracted output as the measured output signal to the second mean square value circuit.

4,218,737

REVENUE METERING SYSTEM FOR POWER COMPANIES

David J. Buscher, Silver Spring, Md.; Robert G. Ellingwood, Vancouver, Wash., and Marc A. Ressler, College Park, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 30, 1977, Ser. No. 829,037

Int. Cl.[3] H02J *13/00*; G01R *11/57, 19/30*

U.S. Cl. 364—493 **5 Claims**

1. A microprocessor system for enabling remote billing by a power supplier of customer power consumption comprising:

peripheral interface means for receiving power consumption data as a function of a preselected scale factor and transmitting it along a data bus;

memory means connected to the data bus for storing the power consumption data;

monitoring means connected to the output of the peripheral interface means for providing power consumption data to a customer;

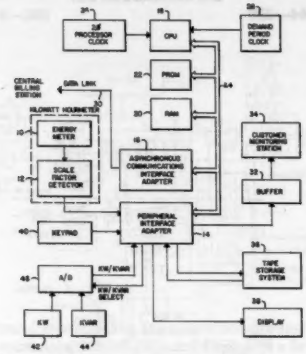
display means connected to the output of the peripheral interface means for selectively displaying stored data to a system operator;

means connected to the input of the peripherals interface means for allowing manual accessing of the data by the operator; and

asynchronous communications interface means connected to the data bus for transmitting data in the memory means, to

data lines thereby enabling a central station at opposite ends of the data links to compute billing; and

a central processing unit connected to the data bus for controlling the operation of the peripheral interface and asynchronous communications interface means as well as the memory means;



first clock means connected to the central processing unit for clocking the unit through its operation, and,

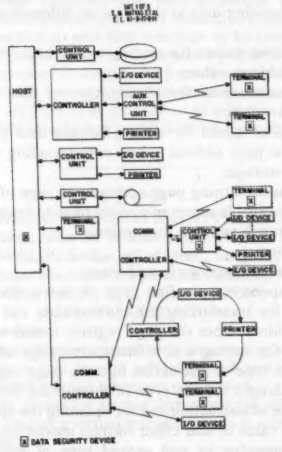
second clock means connected to the central processing unit for synchronizing a preselected demand period for both customer and power supplier.

4,218,738

METHOD FOR AUTHENTICATING THE IDENTITY OF A USER OF AN INFORMATION SYSTEM

Stephen M. Matyas, and Carl H. W. Meyer, both of Kingston, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1978, Ser. No. 903,286
Int. Cl.² G06F *3/00*; H04K *1/00*
U.S. Cl. 364—200 **24 Claims**



1. In a system providing data communication between a terminal and a host data processing system each having cryptographic apparatus for cryptographic data communications and provided with a terminal master key and a host master key, a process for authenticating the identity of a terminal user provided with an identification number and a secret password comprising the steps of:

providing said terminal user identification number at said terminal,

providing said password at said terminal,

performing an operation at said terminal in accordance with said terminal user identification number and said password to obtain a terminal user authentication pattern,

transferring said terminal user identification number and said authentication pattern from said terminal to said host data processing system,

providing a predetermined number at said host data processing system,

performing a first operation at said host data processing system in accordance with said predetermined number and said terminal user identification number to obtain a terminal user first verification pattern,

providing a predetermined terminal user test pattern at said host data processing system,

performing a second operation at said host data processing system in accordance with said terminal user test pattern and said terminal user authentication pattern to obtain a terminal user second verification pattern, and

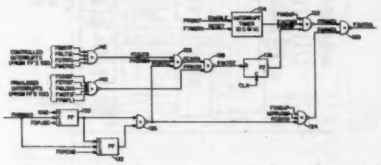
comparing said first verification pattern with said second verification pattern to authenticate the identity of said terminal user.

4,218,739

DATA PROCESSING INTERRUPT APPARATUS HAVING SELECTIVE SUPPRESSION CONTROL

Virendra S. Negi, Pepperell, and Ming T. Miu, Chelmsford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 28, 1976, Ser. No. 736,657
Int. Cl.² G06F *9/18*
U.S. Cl. 364—200 **12 Claims**



1. Interrupt apparatus for a data processing system said apparatus for selectively suppressing interrupts generated by a data processor and by peripheral devices connected to said processor, said apparatus comprising:

A. first means for receiving a first plurality of said interrupts, each of said first plurality being a controlled interrupt;

B. second means for receiving a second plurality of interrupts concurrently with the receipt of said first means for receiving, each of said second plurality being a privileged interrupt, said privileged interrupts having a higher priority than said controlled interrupts and each of said individual controlled and privileged interrupts having a predetermined priority corresponding to a particular service routine to be performed in said data processing system;

C. first means, coupled with said first and second means for receiving, for suppressing the performance of the service routines corresponding to each of said controlled or privileged interrupts received by said first and second receiving means at a given time while a service routine corresponding to a previously received one of said controlled or privileged interrupts is being performed;

D. second means coupled with said first means for receiving, for suppressing the performance of the service routines corresponding to each of said controlled interrupts received at said given time for the period of time required by said system to store status information relating to the routine being performed by said system at said given time;

E. means coupled with said first and second means for sup-

pressing, for generating an interrupt signal in response to receipt of one of said controlled or privileged interrupts not suppressed by either said first or second means for suppressing; and

F. means, coupled with said means for generating and responsive to receipt of said interrupt signal for initiating the performance of the service routine corresponding to said one of said controlled or privileged interrupts not suppressed.

4,218,740

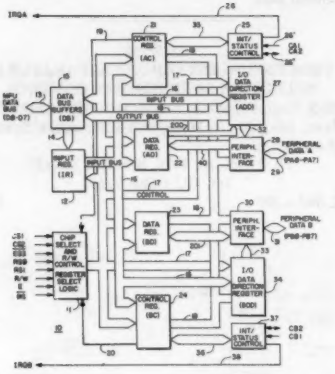
INTERFACE ADAPTOR ARCHITECTURE

Thomas H. Bennett; Earl F. Carlow, both of Scottsdale; Edward C. Hepworth, Apache Junction, all of Ariz.; William D. Mensch, Jr.; Charles I. Peddle, both of Norristown, Pa.; Gene A. Schriber, Tempe, and Michael F. Wiles, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 519,138, Oct. 30, 1974. This application Jan. 5, 1977, Ser. No. 757,120

Int. Cl.[3] G06F *3/00*

U.S. Cl. 364—200 **8 Claims**



1. An interface adaptor means coupled between a first data bus and a second data bus for effecting transfer of information between said first data bus and said second data bus and having a plurality of selection input terminals for receiving selection inputs and a control input terminal for receiving a control input, said selection inputs and control input being generated by a unit communicating with said interface adaptor means over said first data bus, said interface adaptor means comprising:

selection means responsive to said selection inputs and said control input for producing a plurality of selection signals each corresponding to a unique configuration of said selection inputs;

first buffer means responsive to said control input and coupled to said first data bus for receiving information from and sending information to said first data bus;

second buffer means responsive to a first selection signal and coupled to said second data bus for receiving information from and sending information to said second data bus;

data transfer means coupled to said first and second buffer means for effecting transfer of information between said first and second buffer means; and

control register means responsive to a second selection signal and coupled to said data transfer means for receiving and storing control information from said first buffer means in response to a write condition of said control input and sending a representation of the contents of said control register means to said first buffer means in response to a read condition of said control input.

4,218,741

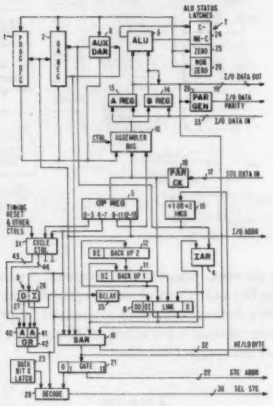
PAGING MECHANISM

Jerry D. Dixon, and Joel C. Leininger, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,221

Int. Cl.[2] G06F *9/20*

U.S. Cl. 364—200 **9 Claims**



1. For use in a data processing system, apparatus for branching and linking between computer routines located in the same or different pages of a store, said apparatus comprising:

said store adapted to hold program instructions and their corresponding data in the same or different pages of said store;

offset address means for storing a current instruction page offset address value;

data register means for storing current data page offset address values;

page register means for storing current data page and instruction page address values corresponding to any page in said storage;

link means for storing page address and page offset address values to enable return of control to an instruction following a branch and link instruction;

delay means;

a source of instructions in said store;

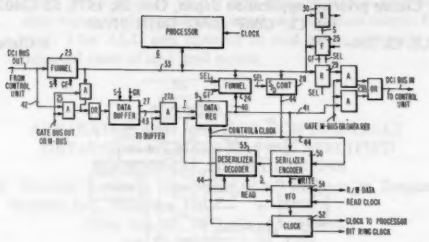
means responsive to a first type of instruction from said source for transferring the current data and instruction page address from the page register means to the delay means, for setting a new instruction page address from said first type of instruction into the page register means for fetching a second type of instruction following said first type of instruction and for updating the current offset address value in said offset address means; and

means responsive to said second type of instruction for fetching an instruction in the new page in accordance with the new page address in said page register means and the offset address bits in said second type of instruction and for transferring said current data and instruction page address values from the delay means and the updated current offset address value from the offest address means to the link register.

4,218,742
SYSTEM FOR CONTROLLING A SERIAL DATA CHANNEL WITH A MICROPROCESSOR

James E. Carlton, and Werner J. Schaeuble, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,146
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 13 Claims



1. A system for controlling the bidirectional transfer of data through a serial data channel connected between a first parallel by bit interface and a second serial by bit interface, said system comprising:

a serial data channel including a first means for converting a parallel by bit input signal to a serial by bit output signal for said second interface and a serial by bit input signal from said second interface to a parallel by bit output signal, and a register for storing each said parallel by bit signal;

a microprocessor having a parallel by bit input port and a parallel by bit output port, each of which includes a plurality of instruction addressable units for transferring a byte of data to or from the processor;

means for selectively connecting said parallel by bit interface to the input of said register or one of said input port units;

means selectively connecting the output of said register to another said input port unit or to said first interface; and

control means including said microprocessor and clock circuits connected to said serial channel to cause a byte of data presented to said first interface to be transferred to either said microprocessor in parallel by bit form or to said second interface in serial by bit form through said register, or a byte of data presented to said second interface in serial by bit form to be transferred to said microprocessor or said first interface in parallel by bit form through said register.

4,218,743
ADDRESS TRANSLATION APPARATUS

Roy L. Hoffman; Glen R. Mitchell, both of Pine Island, and Frank G. Soltis, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,490
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 8 Claims

1. Address translation apparatus for translating virtual storage addresses to real storage addresses and real storage addresses to virtual storage addresses comprising:

first register means for storing virtual storage addresses,

means for loading a virtual storage address in said first register means,

means for translating said virtual storage address in said first register means to a translated real storage address,

second register means for storing translated real storage addresses,

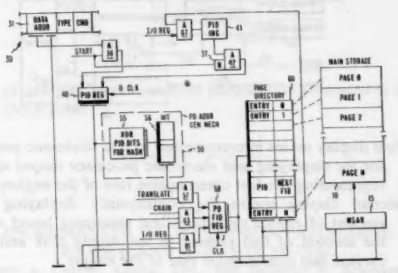
means for loading said translated real storage address into said second register means,

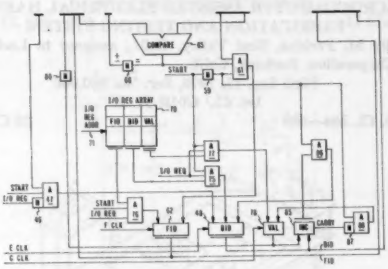
an addressable table having a number of entries corresponding to the addressing range of said translated real storage address, each entry containing a virtual storage address and an associated next real storage address, said entries being ordered according to real storage addresses,

first gating means connected to said second register means,

means connecting said second register means to address said addressable table,

compare means connected to receive a virtual storage address from said addressable table and from said first register means and operable to generate equal or unequal comparison result signals based upon comparison or non-comparison of the virtual storage address from said table with the virtual storage address from said first register means,





means for applying said equal comparison result signal to said first gating means to render the same operable to pass said translated real storage address from said second register means,

a real storage address register connected to receive said translated real storage address passed by said first gating means,

second gating means connected to receive a next real storage address from said addressable table and operable in response to said unequal comparison result signal to pass said next real storage address, and

means for loading said next real storage address passed by said second gating means into said second register means.

4,218,744
FUEL FLOW CONSUMPTION MONITORING SYSTEM

Wayne L. Pratt, Dallas, and Paul E. King, Richardson, both of Tex., assignors to Avicon Development Group, Dallas, Tex.

Filed Aug. 8, 1978, Ser. No. 931,875
Int. Cl.[2] G01F *9/00*
U.S. Cl. 364—442 25 Claims

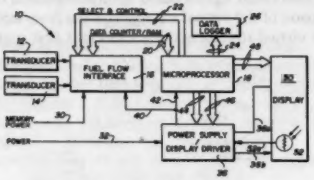
1. A monitoring device for monitoring fuel consumption of an engine having a fuel supply tank and an input fuel line extending between the fuel supply tank and the engine comprising:

means disposed within the input fuel line for measuring the

fuel flow rate of fuel flowing from the supply tank to the engine and for generating an output digital pulse stream proportional to the fuel flow rate;

means for generating a signal representing an initial amount of fuel stored in the supply tank;

an electronic processor responsive to said digital pulse stream and said signal representing an initial amount of fuel for generating an output signal representing the fuel consumption rate of the engine;



first display means interconnected to said electronic processor for displaying said electronic processor output signal representing the fuel consumption rate of the engine; and

second display means for continuously displaying the amount of engine operating time remaining based upon the amount of fuel present in the supply tank and the current fuel consumption rate of the engine.

4,218,745

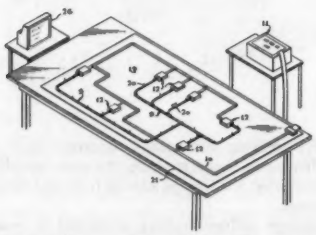
MICROCOMPUTER ASSISTED ELECTRICAL HARNESS FABRICATION AND TESTING SYSTEM

Kelly M. Perkins, Simi Valley, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Sep. 11, 1978, Ser. No. 940,900

Int. Cl.[2] G01R *31/02*

U.S. Cl. 364—489 **20 Claims**



1. A computerized test system for testing a harness comprising a plurality of connectors, each having a plurality of pins thereon, and connecting wires, said system comprising:

a computer for transmitting a test pulse of known electrical characteristics,

a plurality of transponders, each coupled to one of said connectors, each transponder coupled to said computer and under control of said computer for the coupling of said transmitted pulse to a first selected pin of a first selected connector, and for the coupling of a received pulse from a second selected pin of a second selected connector to said computer, said computer acting to select said first and second pins and connectors, and

means under control of said computer for receiving said test pulse, for measuring the electrical characteristics of said received test pulse, said electrical characteristics being representative of the resistance of the path taken by said pulse, and for communicating the measurement of said electrical characteristics to said computer,

whereby said computer operates to determine from said measurement the resistance of the path taken by said test pulse from said first selected pin through a connecting harness wire to said second selected pin to test said harness.

4,218,746

METHOD AND APPARATUS FOR CALIBRATING ION CONCENTRATION MEASUREMENT

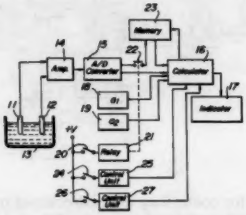
Kiyozo Koshiishi, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1978, Ser. No. 950,294

Claims priority, application Japan, Oct. 20, 1977, 52-126022

Int. Cl.[2] G06F *15/42*; G01N *27/46*

U.S. Cl. 364—571 **6 Claims**



3. An apparatus for calibrating an ion concentration measurement with the aid of at least first and second standard solutions having known different ion concentrations a_1 and a_2 and detected potential values E_1 and E_2 corresponding to said known ion concentrations a_1 and a_2, respectively, comprising:

means for presetting said known ion concentrations a_1 and a_2,

means for calculating a constant c defined by an equation

$$C = \frac{E_1 - E_2}{\log (a_1/a_2)}$$

with using the preset ion concentrations a_1 and a_2 and the detected potential values E_1 and E_2, means for storing the calculated constant c, the ion concentration a_1 of the first standard solution and its related potential value E_1, and means for effecting a recalibration by replacing said stored potential value E_1 by a newly detected potential value E_1' for the first standard solution.

4,218,747

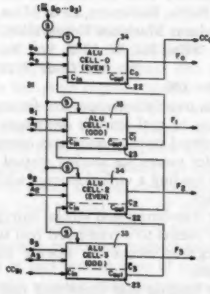
ARITHMETIC AND LOGIC UNIT USING BASIC CELLS

Kenichi Miura, Saratoga, Calif., assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 5, 1978, Ser. No. 912,451

Int. Cl.[2] G06F *7/48, 7/50*

U.S. Cl. 364—716 **16 Claims**



1. An arithmetic and logic unit including a plurality of 1-bit

arithmetic and logic unit (ALU) cells wherein each 1-bit ALU cell comprises,

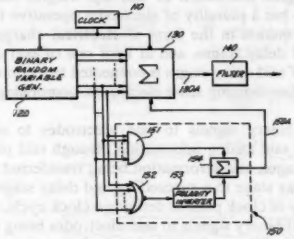
a plurality of cellular integrated basic cells connected to receive inputs including a first data input and a second data input for logically combining the first and second data inputs to form a data output as a function of said first and second data inputs and wherein each 1-bit ALU cell includes a portion of a semiconductor body including a plurality of semiconductor active elements arrayed in said body in accordance with a grid pattern, where said first data input, said second data input and said data output for each 1-bit ALU cell connect to said active elements at selected ones of said grid points.

4,218,748

APPARATUS AND METHOD FOR DIGITALLY OBTAINING SIGNALS HAVING SPECIFIED STATISTICAL DISTRIBUTIONS

R. Wendell Goodwin, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Sep. 25, 1978, Ser. No. 945,162
Int. Cl.² G06F *15/34, 1/02*
U.S. Cl. 364—717 **30 Claims**



1. Apparatus for digitally generating a specified statistical distribution, comprising:

means for producing digital bits having properties of randomness;

processing means coupled to said producing means and being responsive to a group of said digital bits for generating a signal which approximates the specified statistical distribution;

sensing means also coupled to said producing means and being responsive to said group of digital bits for sensing at least one characteristic of said group of bits; and

means coupled to said sensing means and said processing means for modifying the signal generated by said processing means whenever said characteristic is sensed by said sensing means, such that the statistical distribution of the generated signal tends to more closely approach the specified statistical distribution.

4,218,749

APPARATUS AND METHOD FOR DIGITAL NOISE SYNTHESIS

Jean Babaud, Sceaux, France, and R. Wendell Goodwin, Dunwoody, Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

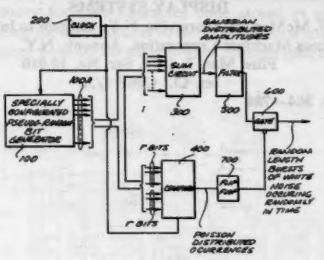
Filed Sep. 25, 1978, Ser. No. 945,163
Int. Cl.² G06F *7/00*
U.S. Cl. 364—717 **31 Claims**

1. Apparatus for generating noise having characteristics of repeatability and reproducibility, comprising:

means for generating clock pulses;

pseudo-random bit generating means responsive to said clock pulses for simultaneously generating at each clock pulse, a plurality of parallel uncorrelated pseudo-random digital bits which are successive groups of bits of a pseudo-random sequence; and

means for operating on the bits generated at each clock pulse to produce an output noise signal as a function of the



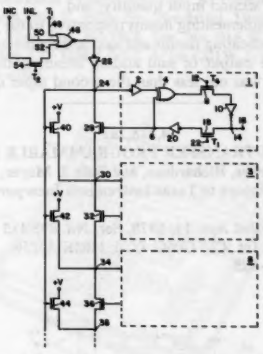
plurality of pseudo-random parallel bits generated at that clock pulse.

4,218,750

INCREMENTER WITH COMMON PRECHARGE ENABLE AND CARRY-IN SIGNAL

Ernest A. Carter, Austin, Tex., and Anthony E. Kouvoussis, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1978, Ser. No. 945,738
Int. Cl.² G06F *7/48*; H03K *23/08*
U.S. Cl. 364—770 **13 Claims**



1. An incrementer for selectively incrementing by one a digital value stored within a digital storage circuit, the digital storage circuit including first and second input terminals and at least one output terminal, said incrementer comprising:

(a) first means having a control terminal, said first means being for generating a control signal at the control terminal, the control signal being of a first or a second voltage, the control terminal being directly connected to the first input terminal,

(b) second means directly connected to the control terminal of said first means and coupled to the second input terminal, said second means being responsive to the control signal for initializing a first input potential at the second input terminal, and

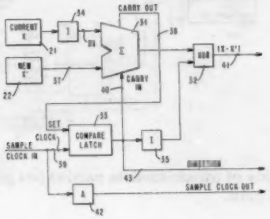
(c) third means directly connected to the first input terminal and coupled to the second input terminal, said third means being responsive to the control signal and being responsive to an output signal generated by the at least one output terminal of said digital storage circuit for selectively establishing a second input potential at the second input terminal.

4,218,751

ABSOLUTE DIFFERENCE GENERATOR FOR USE IN DISPLAY SYSTEMS

David F. McManigal, Stormville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1979, Ser. No. 18,010
Int. Cl.[2] G06F 7/50
U.S. Cl. 364—784 7 Claims



1. For use in a vector graphic display system, a mechanism for generating an indication of the absolute difference between first and second input quantities comprising:

first complementing means for complementing the first input quantity;

adding means having one input connected to the output of said complementing means and another input connected to the second input quantity;

indicating means responsive to the output of said adding means to indicate whether the first input quantity was less than the second input quantity; and

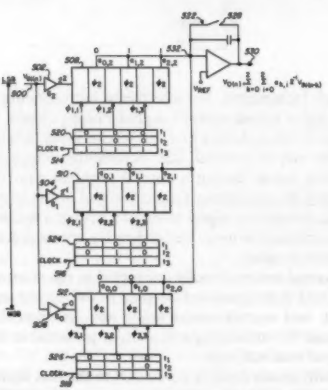
second complementing means responsive to the joint outputs of said indicating means and said adding means to complement the output of said adding means if the first input quantity was not less than the second input quantity.

4,218,752

CHARGE-TRANSFER PROGRAMMABLE FILTER

Charles R. Hewes, Richardson, and Dale J. Mayer, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 11, 1978, Ser. No. 895,415
Int. Cl.[2] G06G 7/16; H03K 5/159
U.S. Cl. 364—825 32 Claims



1. A programmable charge-transfer filter comprising:

a first plurality of charge-transfer delay stages connected in series, each of said delay stages defining a digital coefficient of a programmable tap weight, each of said delay stages having a plurality of electrodes operative to transfer analog information in the form of electrical charge through each of said delay stages, at least one of said electrodes from each of said delay stages connected to a common communication line defining sense electrodes;

means for applying binary signals to said electrodes to transfer said analog information through said plurality of delay stages, said information being transferred from one said delay stage to a succeeding said delay stage during a plurality of clock periods defining a clock cycle, said applying means operative to selectively transfer said electrical charge to a position under selected sense electrodes during one said clock period;

means for sensing the presence or absence of said transferred electrical charge under said sense electrodes, said presence of electrical charge defining a binary 1 coefficient, said absence of electrical charge defining a binary 0 coefficient; and

means for summing said sensed electrical charge to provide an output voltage proportional to the sum of said transferred electrical charge.

18. A method of processing analog signals by employing a charge-transfer filter having a digitally programmed tap weight and comprising a first plurality of charge-transfer delay stages connected in series, wherein each of said delay stages defines a digital coefficient of said tap weight, each of said delay stages has a plurality of electrodes operative to transfer analog information in the form of electrical charge through each of said delay stages, and at least one of said electrodes from each of said delay stages is connected to a common communication line defining sense electrodes; comprising the steps of:

applying binary signals to said electrodes to selectively transfer said analog information through said plurality of delay stages, said information being transferred from one said delay stage to a succeeding said delay stage during a plurality of clock periods defining a clock cycle, the application of binary signals to said electrodes being operative to selectively transfer said electrical charge to under selected said sense electrodes during one said clock period;

sensing the presence or absence of said transferred electrical charge under said sense electrodes, said presence of electrical charge defining a binary 1 coefficient, said absence of electrical charge defining a binary 0 coefficient; and

summing said sensed electrical charge to provide an output proportional to the sum of said electrical charge present.

4,218,753

MICROCODE-CONTROLLED MEMORY REFRESH APPARATUS FOR A DATA PROCESSING SYSTEM

Gardner C. Hendrie, Carlisle, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Feb. 28, 1977, Ser. No. 773,023
Int. Cl.[2] G06F 13/00; G11C 7/00
U.S. Cl. 364—900 5 Claims

1. In a digital data processing system for performing at least one data processing algorithm composed of a sequence of data processing operations;

said data processing system including

dynamic memory means for storing and providing a sequence of instructions representing said sequence of data processing operations;

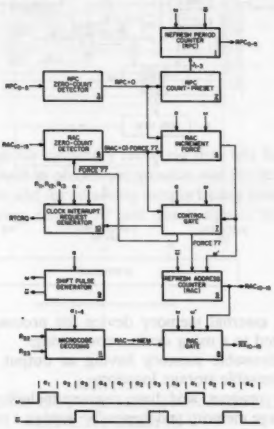
CPU responsive to each one of said instructions for performing a data processing operation corresponding to each one of said instructions, each one of said data processing operations composed of a sequence of CPU operating states,

said CPU including microinstruction control means connected from said dynamic memory means and responsive to said each one of said instructions for storing and providing to said CPU a corresponding sequence of microinstructions for selecting each one of a corresponding said sequence of CPU operating states; and,

system clock means for providing timing pulses to said CPU for controlling occurrence of each of said microinstructions;

memory refresh means for refreshing said dynamic memory means at successive first certain time intervals, each one of said successive first certain time intervals being less than a predetermined refresh time interval, said memory refresh means comprising:

microcode decoding means connected from said microinstruction control means and responsive to each one of selected certain of said microinstructions for providing refresh gate signals indicating said dynamic memory means is to be refreshed, said certain of said microinstructions being selected by said decoding means for each one of said at least one data processing algorithm so that at least one of said certain of said microinstructions will be



provided by said microinstruction control means during said each one of said successive first certain time intervals;

first counter means responsive to said system clock means for generating refresh timing pulses occurring during said each one of said successive first certain time intervals;

second counter means responsive to said refresh timing pulses for generating successive memory refresh address signals for refreshing a plurality of successive portions of said dynamic memory means; and,

refresh address gating means for receiving said successive memory refresh address signals and responsive to said refresh gate signals to provide said memory refresh signals to said dynamic memory means upon occurrence of said each one of said certain of said microinstructions to refresh said successive portions of said dynamic memory means.

4,218,754

CONTROL OF HIGH SPEED PRINTER BY LOW SPEED MICROPROCESSOR

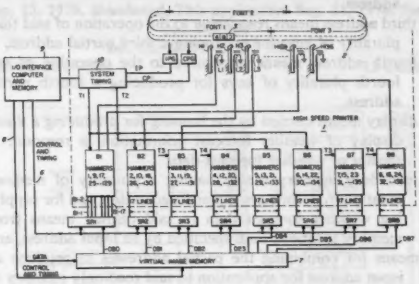
Timothy N. Schaeffer, Arlington, Mass., assignor to Data Printer Corporation, Cambridge, Mass.

Filed Mar. 29, 1978, Ser. No. 891,297

Int. Cl.[2] G06F *3/12*; B41J *5/30*

U.S. Cl. 364—900 **6 Claims**

1. In combination with a high speed printer having n print hammers and n print hammer drivers for printing an n column line and a source-destination computer including a low speed CPU, an input data memory capable of accepting n character codes each directing which of a series of m characters is to be printed in a different one of the n columns in a line to be printed, a virtual image memory comprising a register for each of m characters for each of n columns in a line to be printed, means for loading said input data memory with n character codes for ach line to be printed under DMA control, said CPU being programmed to access said input data memory on a column by column basis and to load a zone of said virtual image memory for each character code stored in said data input memory for each column to be printed with a true bit for each character position for each column printing time at which



printing of a corresponding character is to be printed, and means controlled by said printer for calling forth the contents of a different zone of said virtual image memory for each character coming into printing position relative to a predetermined column of said printer and distributing the contents of said zone to the print hammer drivers for each hammer in said printer.

4,218,755

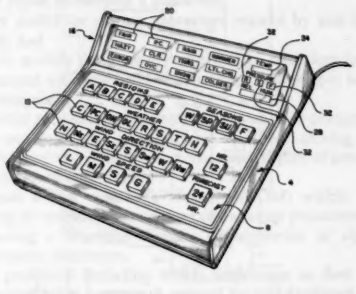
WEATHER FORECASTING APPARATUS

Steven A. Root, 804 E. Hills Dr., Bountiful, Utah 84010

Filed Jun. 19, 1978, Ser. No. 916,152

Int. Cl.[2] G06F *3/02, 3/14*; G01W *1/10*

U.S. Cl. 364—900 **9 Claims**



1. Apparatus for producing weather forecast information in response to supplied information, said apparatus comprising

a housing dimensioned so that it can be held in the hand,

keyboard means disposed in said housing and including

a first plurality of manually operable keys upon which current weather information may be entered by operation of keys appropriately designated and representing different types of weather,

a second plurality of manually operable keys upon which current wind speed information may be entered by operation of keys appropriately designated and representing different wind speeds,

a third plurality of manually operable keys upon which current wind direction information may be entered by operation of keys appropriately designated and representing different wind directions,

a fourth plurality of manually operable keys upon which current season of the year information may be entered

by operation of keys appropriately designated and representing diffferent seasons of the year,

first address means responsive to the operation of said first plurality of keys for producing a first partial address,

second address means responsive to the operation of said second plurality of keys for producing a second partial address,

third address means responsive to the operation of said third plurality of keys for producing a third partial address,

fourth address means responsive to the operation of said fourth plurality of keys for producing a fourth partial address,

display means carried by the housing for producing a visual display of weather forecast information in response to receipt of weather forecast data,

read only memory means having a plurality of memory locations for storing weather forecast data and for supplying weather forecast data to said display means from memory locations each specified by an input address, and

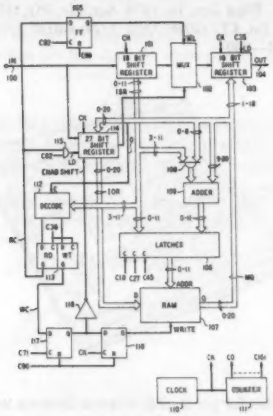
means for combining the partial addresses to produce an input address for application to said read only memory to identify a location in the memory from which weather forecast data is to be read.

4,218,756

CONTROL CIRCUIT FOR MODIFYING CONTENTS OF PACKET SWITCH RANDOM ACCESS MEMORY

Alexander G. Fraser, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 19, 1978, Ser. No. 916,705
Int. Cl.[2] H04J 3/08
U.S. Cl. 364—900 **6 Claims**



1. In a control system for bursts of data, each data burst including a header portion and a subsequent data portion, a random access memory system (**107**) having means for reading out data from addressed ones of storage locations in the memory and means (**101, 103, 106, 108, 109**) responsive to data information in the header portion for addressing the storage locations and for modifying the header portion with the data thereby read out of the addressed storage locations, characterized by

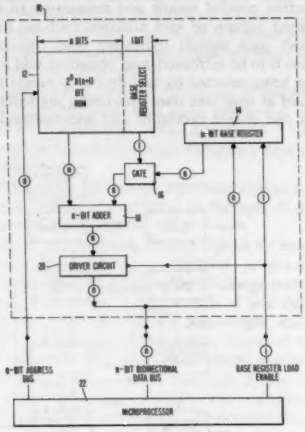
means (**106, 112, 113WT, 114, 116, 117, 118**) responsive to certain of the data read out of the addressed storage locations for writing data from the data portion of the data burst into memory storage locations addressed by an address part of the data portion, the writing means being enabled by predetermined command data in the data portion.

4,218,757

DEVICE FOR AUTOMATIC MODIFICATION OF ROM CONTENTS BY A SYSTEM SELECTED VARIABLE

Daniel P. Drogichen, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 29, 1978, Ser. No. 920,557
Int. Cl.[2] G06F 13/00, 9/20
U.S. Cl. 364—900 **3 Claims**



1. An external memory device for processing data to be transmitted to a using device, comprising:

an addressable memory having an output and containing addressable storage locations;

a base register, said base register including a read/write storage memory and means for writing a pattern of data in said read/write storage memory;

gating means connected to the output of said base register and a first subset of the set of output bit positions of said addressable memory, said gating means responsive to selected data patterns from the first subset of said set of output bit positions of said addressable memory, said gating means for selectively gating the contents of said base register to the output of said gating means;

an adder having two inputs and an output, the inputs to said adder connected to a second subset of the set of output bit positions of said addressable memory and the output of said gating means respectively, the output of said adder for supplying processed data to said using device; and

output control means, responsive to the writing of data in said base register, said output control means for turning off the output of said adder.

4,218,758

PARALLEL-TO-SERIAL BINARY DATA CONVERTER WITH MULTIPHASE AND MULTISUBPHASE CONTROL

Francis K. Allen, and Victor H. Chin, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,141
Int. Cl.[2] G06F 5/04
U.S. Cl. 364—900 **7 Claims**

1. A parallel-to-serial binary data converter comprising:

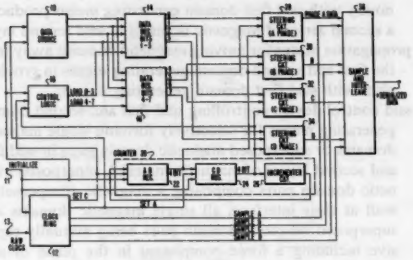
first and second data registers for alternately storing first and second groups of binary data bits, said two groups of data bits forming a data byte;

a multiplicity of steering circuits coupled to said data registers for processing selected data bits received from said data registers;

a counter for providing phase signals to said steering circuits

so that said selected data bits are passed to the outputs of said steering circuits during different phases assigned to different data bits;

a clock ring for providing clock pulses to said counter for controlling the timing of said phase signals generated by said counter; and



a sample circuit for cyclically receiving data bits from said steering circuits in phased progression and for serializing said data bits, and for receiving sample timing pulses from said clock ring related to said phase signals from said counter.

4,218,759

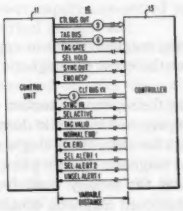
SYNC IN-SYNC OUT CALIBRATION FOR CABLE LENGTH DELAYS

James E. Carlton, and Werner J. Schaeuble, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,150

Int. Cl.[2] G06F *3/00*

U.S. Cl. 364—900 **12 Claims**



1. In a disk file controller, a system for controlling the transfer of data to be recorded on a disk file wherein a byte of data to be recorded arrives at said controller at the same predetermined bit time relative to when it is actually recorded, regardless of the signal propagation time between the controller and the data source for different installations;

said control system including means for measuring the number of bit times that occur between the time said controller requests a first byte of data and the time said first byte of data is actually received;

and means connected to said measuring means to request another byte of data to be received at said predetermined bit time relative to when it is to be recorded, including means to issue said request said measured number of bit times prior to said predetermined bit time.

4,218,760

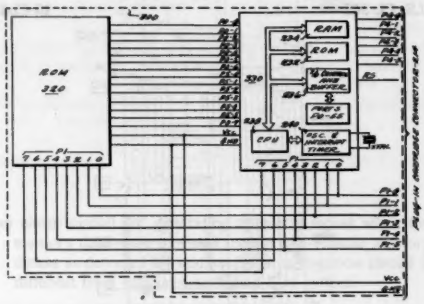
ELECTRONIC DICTIONARY WITH PLUG-IN MODULE INTELLIGENCE

Michael Levy, Plantation, Fla., assignor to Lexicon, Miami, Fla.

Continuation-in-part of Ser. No. 848,527, Nov. 3, 1977, Pat. No. 4,158,236, which is a continuation-in-part of Ser. No. 723,049, Sep. 13, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,050

Int. Cl.[2] G06F *15/02, 15/38*

U.S. Cl. 364—900 **12 Claims**



1. An information storage and retrieval apparatus comprising:

a hand-held housing comprising:

a plurality of display means disposed on said housing, each for displaying an alpha-numeric character, and

a keyboard on said housing and having a plurality of keys each associated with an alpha-numeric character or command for entering a sequence of alpha-numeric characters and commands, and producing command signals and sequences of character signals, each character signal identifying a character;

memory means for storing characters entered by said keyboard; and

a plug-in module removably, mechanically, and electrically connected with said hand-held housing, said plug-in module comprising:

a central processor within said plug-in module connected to said display means and to said keys for searching said keyboard and causing the storage and display of entered and stored characters,

at least a first read/only memory (ROM) within said plug-in module connected to said central processor for storing a plurality of pairs of sequences of alpha-numeric characters,

said processor including means responsive to first and second given commands entered by said keyboard, for searching said first ROM to compare, one pair after another, one sequence of each pair with the sequence entered by said keyboard following entry of said first given command until a match is made, and for causing, subsequent to a match, the matching pairs of sequences to be displayed, the character in each said display varying in time without any manual operation of said keyboard so that the number of characters in said matching pairs can exceed the number of said display means, searching and causing means searching, following entry of said second given command, to compare said other sequence of each pair with said entered sequence until a match is made and causing said matching pairs of sequences to be displayed,

a second read/only memory (ROM) within said plug-in module and connected to said processor for storing instructions for searching said first ROM and causing said pair of sequences to be displayed, and searching said keyboard, and

said plug-in module permitting change of said pairs of sequences.

4,218,761

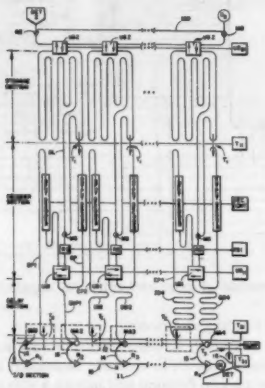
MAGNETIC BUBBLE DOMAIN DECODER ORGANIZATION

Thomas T. Chen, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 8, 1978, Ser. No. 958,924

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—4 **10 Claims**



1. A bubble domain organization especially adapted for input and output operations at the same side thereof, said organization comprising:

storage means,

decoder means connected to said storage means, and

input-output means comprising a continuous propagation path for receiving bubble domains from a bubble domain generator,

at least one active transfer switch for transferring bubble domains from said continuous propagation path to said decoder means, and

active switch means for transferring bubble domains into and out of said storage means from said decoder means, and

at least one merge means for merging bubble domains into said continuous propagation path from said decoder means.

4,218,762

DEVICE FOR CLOSE-PACKED MAGNETIC DOMAINS

Jan Haisma, and Klaas L. L. Van Mierloo, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 712,948, Aug. 9, 1976, abandoned. This application Jun. 27, 1978, Ser. No. 919,466

Claims priority, application Netherlands, Aug. 15, 1975, 7509733

Int. Cl.[2] G11C *11/15, 19/08*

U.S. Cl. 365—32 **16 Claims**

1. A device for storing digital information in the form of magnetic domains, comprising:

a control device having an information input terminal;

a non-magnetic substrate layer;

a first layer of magnetic material, structurally integral with said substrate layer;

a second layer of magnetic material, structurally integral with said first layer of magnetic material;

a bias magnetic field generator for producing a magnetic field extending transverse to said first and second layers for sustaining magnetic domains therein;

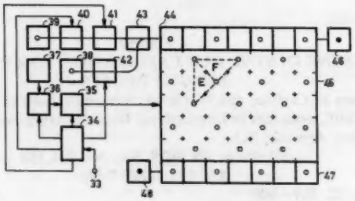
first magnetic domain generating means operative at a first position for locally and sequentially producing a first series of magnetic domains in said first layer;

second magnetic domain generating means operative at a second position for locally and sequentially and synchronously with said first domain generating means producing a second series of magnetic domains in said second layer;

propagation means for moving magnetic domains away from the first and second domain generating means in synchronism with said first domain generating means;

said control device controlling said first and second domain generating means for selectively forming single magnetic domains or superposed magnetic domain pairs in said first and second layers of magnetic material, superposed magnetic domain pairs comprising a magnetic compensation wall at their interface, all single magnetic domains and superposed magnetic domain pairs being mutually repulsive including a force component in the plane of said layers;

said first and second layers each comprising at least two magnetic crystalline sublattices with first and second magnetizations which have substantially opposite directions, corresponding sublattices within said first and second layers having magnetizations in opposite directions at locations where there are no magnetic domains in either layer;



detector means for the separate detection of single magnetic domains and superposed magnetic domain pairs;

annihilation means for destroying single magnetic domains and superposed magnetic domain pairs;

a first shift register for serially receiving single magnetic domains or superposed magnetic domain pairs generated by said first and second domain generating means;

a two-dimensional domain array region, having a lattice of domain positions, situated adjacent the first shift register;

coincident propagation means for the coincident driving of a row of magnetic domains from said first shift register transversely into the domain array region; and

confinement means for bounding the domain array region on edges thereof which are transverse to said first shift register, and on an edge which is remote from said first shift register;

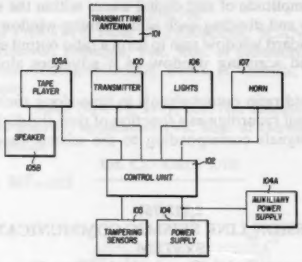
wherein said control device activates said coincident propagation means at instants separated by intervals corresponding to integral numbers of half periods of the propagation means, said intervals having at least a predetermined minimum value for the successive formation of an array of rows of magnetic domains in directions along said first shift register in the domain array region.

4,218,763

ELECTRONIC ALARM SIGNALING SYSTEM

Ishmael C. Kelley, 6625 Piney Br. Rd. N.W., Washington, D.C. 20012, and Lawrence J. Brailsford, 500-23rd St. N.W., Washington, D.C. 20037

Filed Aug. 4, 1978, Ser. No. 931,276
Int. Cl.[2] G08B 13/00
U.S. Cl. 340—65 39 Claims



1. An alarm system for protecting a property comprising:
(a) a transmitter for providing a coded signal;
(b) a transmitting antenna connected to the transmitter for broadcasting the coded signal said transmitting antenna including a motor-driven, telescoping member and said control unit includes a means for extending the member immediately before transmission by the transmitter and means for retracting the member immediately after transmission by the transmitter;
(c) a sensor system for sensing unauthorized tampering with the property;
(d) a first power supply for providing electrical energy;
(e) a control unit for controlling the operation of the transmitter, said control unit connected to the sensor system, the first power supply and the transmitter and having a timing means for activating the transmitter for a limited period of time when the sensor indicates unauthorized tampering;
(f) a receiving antenna for receiving the coded signal;
(g) a receiver connected to the receiving antenna for receiving and decoding the coded signal;
(h) a second power supply connected to the receiver for providing electrical energy; and
(i) a receiver alarm connected to the receiver power supply and the receiver for providing an alarm whenever the receiver receives and decodes the coded signal whereby unauthorized tampering with the property causes the sensor to indicate to the control unit which activates the timing means permitting the transmitter and the transmitting antenna to broadcast for a limited period of time the coded signal which is received by the receiving antenna and the receiver and decoded, resulting in the actuation of the receiver alarm.

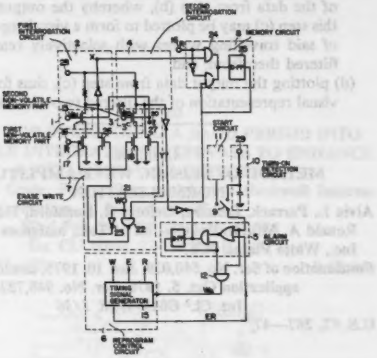
4,218,764

NON-VOLATILE MEMORY REFRESH CONTROL CIRCUIT

Yukio Furuta, Kusatsu, and Tomisaburo Okumura, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 3, 1978, Ser. No. 948,335
Int. Cl.[2] G11C 7/00
U.S. Cl. 365—222 16 Claims

1. A non-volatile memory control circuit comprising:
first non-volatile memory means for memorizing data,
second non-volatile memory means for storing a predetermined data pattern,
first and second interrogation circuits for detecting changes of memory levels of said first and said second non-volatile memory means, respectively, and



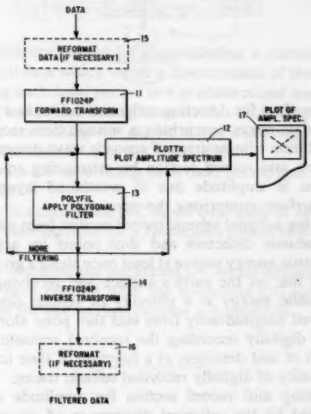
an alarm circuit for generating an alarm signal when the memory data pattern of said second non-volatile memory means as detected by said second interrogation circuit is different from said predetermined data pattern.

4,218,765

TWO-DIMENSIONAL FREQUENCY DOMAIN FILTERING

Robert R. Kinkade, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,873
Int. Cl.[2] G01V 1/28, 1/36
U.S. Cl. 367—45 8 Claims



1. An automatic computer-implemented process for filtering two-dimensional data arising from the reception of traveling waves at a plurality of receiver locations comprising:
(a) automatically computing the Fourier transform of said data to produce the values associated with the spatial frequency and wave number corresponding to the time and distance coordinates of said data;
(b) selectively zeroing in the transformed data obtained in step (a) all data in only one of two sets collectively comprising the total of said transform data, which sets consist essentially of (1) all transform data the spatial frequency and wave number coordinates of which are within the boundaries defined by plurality of arbitrarily chosen verti-

ces of specified spatial frequency and wave number, and (2) the rest of said transform data;

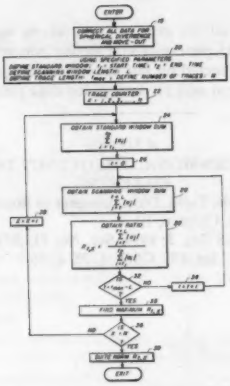
(c) automatically computing the inverse Fourier transform of the data from step (b), whereby the output data from this step (c) may be plotted to form a visual representation of said travelling waves with selectively removed data filtered therefrom; and

(d) plotting the output data from step (c), thus forming said visual representation of the filtered two-dimensional data.

4,218,766
METHOD OF SEISMIC WAVE AMPLITUDE NORMALIZATION

Alvin L. Parrack, Bellaire; Delbert R. Lunsford, Houston, and Ronald A. Mikita, Bellaire, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 540,039, Jan. 10, 1975, abandoned. This application Oct. 5, 1978, Ser. No. 948,732
Int. Cl.² G01V *1/28, 1/36*
U.S. Cl. 367—47 **4 Claims**



1. A method for detecting reflection waves in a plurality of seismic data traces comprising a seismic time record section obtained from a linear array of acoustic wave detectors and for enhancing said record section by attenuating trace to trace variations in amplitude due to weathered layers near the earth's surface, comprising the steps of:

obtaining a digital seismic record section from a linear array of seismic detectors and shot points by activating an acoustic energy source at least once along a given exploration line on the earth's surface and receiving reflected acoustic energy at a plurality of seismic detectors displaced longitudinally from said shot point along said line and digitally recording the received acoustic energy at each of said detectors as a function of time to provide a plurality of digitally recorded seismic traces;

correcting said record section for amplitude attenuation caused by the spherical divergence of acoustic energy from said at least one shot point;

correcting said record section for the different times of arrival of reflected acoustic energy at each of said plurality of detectors due to the different longitudinal displacements of said detectors from said at least one shot point;

correcting said record section for trace to trace amplitude variations due to weathered layers near the earth's surface by

selecting a standard time window in a region of said record containing reflections from continuous and consistent geological boundaries common to all traces comprising said record;

selecting a timewise starting point common to all traces;

selecting a timewise end point common to all traces;

selecting a fixed duration scanning time window common to all traces;

selecting a fixed scanning increment common to all traces;

summing, point by point, the absolute value of the digital trace amplitudes in said standard time window;

placing said scanning window at said starting point;

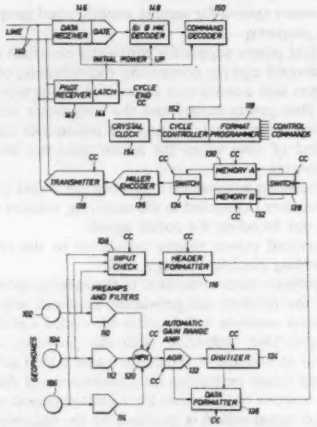
advancing said scanning window from said starting point to said end point along a trace in steps equal to said scanning increment and summing point by point the absolute values of the amplitude of said digital traces within the scanning window and dividing each said scanning window sum by said standard window sum to form a ratio output signal for each said scanning window as it advances along each trace;

aligning said ratio output signals in time along each of said traces; and recording as a function of time the digital ratio output signals corresponding to the seismic record section.

4,218,767
TRANSMISSION LINE SEISMIC COMMUNICATIONS SYSTEM

Wesley L. Joosten; Carl F. Mart, both of El Paso, Tex.; John W. Miller, White's City, N. Mex., and Otice E. Brown, El Paso, Tex., assignors to Gus Manufacturing, Inc., El Paso, Tex.

Continuation of Ser. No. 751,061, Dec. 16, 1976, abandoned, which is a continuation of Ser. No. 699,714, Jun. 25, 1976, abandoned, which is a continuation of Ser. No. 412,763, Nov. 5, 1973, abandoned. This application Feb. 9, 1979, Ser. No. 10,680
Int. Cl.² G01V *1/22, 1/16*
U.S. Cl. 367—79 **7 Claims**



1. A telemetry system for coupling data from a plurality of geophones distributed on the surface of the earth to a recording system comprising:

a plurality of randomly disposed remote data acquisition units each having; at least one geophone input adapted for connection to a geophone, a first port adapted for connection to a twin-lead transmission line, and signal processing means connected to said geophone input and to said port for, in response to receipt of an interrogation signal at said first port, generating a digital data word representing a signal present at said geophone input and, after a preselected unique time delay, coupling the digital data word to said first port,

a single twin-lead transmission line connected to said first port of each of said randomly disposed remote data acquisition units, and

a central data receiving station having; a second port connected to said transmission line; an output adapted for

connection to a recording system; interrogation means for applying an interrogation signal to said second port; and receiving means coupled to said second port and to said output for receiving data from said remote data acquisition units and coupling said data to said output, wherein the source of said data is identified by the time lapse between sending of an interrogation signal and receipt of a particular data word.

4,218,768

APPARATUS FOR ULTRASONIC SCANNING

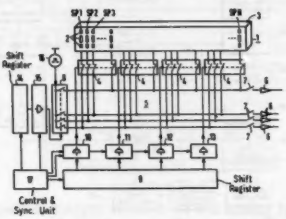
Dieter Hassler, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 11, 1977, Ser. No. 850,600

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658222

Int. Cl.[2] G01S 9/66

U.S. Cl. 367—105 **7 Claims**



1. Ultrasonic scanning apparatus operable for emission of an ultrasonic transmission pulse and operable during a reception phase for receiving echo pulses from varying scanning depths, during each scanning operation, said apparatus having an ultrasonic applicator comprising a plurality of ultrasonic transducer elements spatially adjacently arranged in a surface, reception means for association with the transducer elements, and control means controlling focussing of the transducer elements to varying scanning depths by connecting respective corresponding sets of said transducer elements with said reception means in accordance with predeterminable surface patterns, characterized by the following relationships which prevent switching clicks occurring in the reception phase upon switching of surface patterns from reaching the ultrasonic transducer elements as noise echoes:

(a) said reception means comprising reception lines connecting with the respective ultrasonic transducer elements; and said reception means having a series connection of a buffer amplifier (18, 19, 20, etc.), an input switch (S3, S31, S32) and an output switch (S4, S41, S42) inserted at least in the reception line of each transducer element (W1, W2, W3, etc.);

(b) each buffer amplifier (18, 19, 20, etc.) being arranged in such manner that its input is connected to the input switch (S3, S31, S32) at the transducer element (W1, W2, W3, etc.);

(c) said control means comprising a control installation for the input and output switch of each buffer amplifier which closes the input switch (S3, S31, S32) of the buffer amplifier in the time between emission of a transmission pulse and reception of echo pulses and only subsequently also closes the output switch (S4, S41, S42) for the actual reception of echo pulses,

(d) said control installation providing means whereby the switching click respectively generated upon closing the input switch (S3, S31, S32) cannot disturb the transducer elements since the closing of the input switch ensues outside of the actual reception phase, and

(e) said buffer amplifier providing means whereby the closing of the output switch (S4, S41, S42) in the reception phase is not disruptive because such closing only occurs at the output of the respective buffer amplifier so that switching clicks are blocked with respect to the transducer elements by means of the buffer amplifiers.

4,218,769

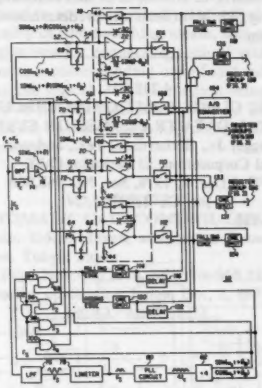
MEANS FOR SUBDIVIDING A BAUD PERIOD INTO MULTIPLE INTEGRATION INTERVALS TO ENHANCE DIGITAL MESSAGE DETECTION

George C. Cagle, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 26, 1979, Ser. No. 15,276

Int. Cl.[3] H04L 27/32; H03D 3/22

U.S. Cl. 375—95 **9 Claims**



1. Demodulation means for demodulating a carrier signal bearing digital data which varies a characteristic of the carrier signal during each baud period in a predetermined manner to identify the baud value during the period, comprising:

means for converting the carrier signal characteristic to a DC signal indicative of the digital data;

timing means for subdividing each baud period into n plural intervals;

means for integrating the DC signal over each of said intervals and storing same for a subsequent period of n–1 intervals, and

means for summing the integrated DC signal attained at the end of each interval with the integrated DC signals attained at the end of the previous n–1 intervals.

4,218,770

DELAY MODULATION DATA TRANSMISSION SYSTEM

David R. Weller, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

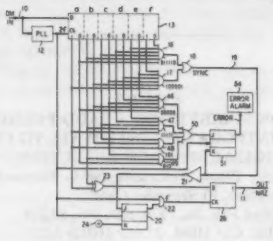
Filed Sep. 8, 1978, Ser. No. 940,723

Int. Cl.[2] H04L 7/00

U.S. Cl. 375—118 **12 Claims**

1. In a data transmission system for self-clocking digital signals representing binary coded information bits occurring at a predetermined bit rate, the coding of said signals being such that said signals have signal level transitions occurring at a rate less than the information bit rate of the signals and the detection of bit-rate signal states includes a phase ambiguity, the improvement comprising,

means for detecting (16, 17, 46-49) in said signals a predetermined double-bit-rate signal level pattern, and



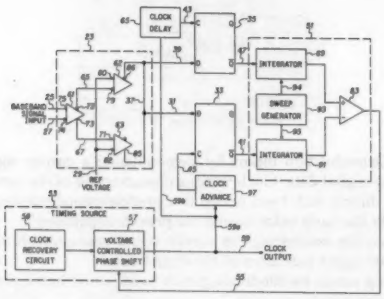
means, responsive to an output of said detecting means, for controlling (23, 26) at least one predetermined function of said system.

4,218,771

AUTOMATIC CLOCK POSITIONING CIRCUIT FOR A DIGITAL DATA TRANSMISSION SYSTEM

Charles R. Hogge, Jr., Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 4, 1978, Ser. No. 965,960
Int. Cl.[2] H03D *3/24*
U.S. Cl. 375—120 7 Claims



1. An automatic clock positioning circuit for automatically positioning a clock pulse for a digital data stream that resembles an eye pattern when seen on an oscilloscope in response to digital data when the sweep is equal to the baud, bit or clock rate, comprising:

timing source for providing a stream of clock pulses;

controllable phase shift means electrically connected to said timing source and in response to an error signal will either advance, delay or maintain the phase of said stream of clock pulses;

pseudo-error indicator means for providing an upper, lower, early and late boundary condition within the center of the eye pattern of the digital data stream and providing a first pseudo-error signal for each violation of the upper or lower boundary condition by the eye pattern at the early boundary condition and a second pseudo-error signal for each violation of the upper and lower boundary condition at the late boundary of the eye pattern:

means for integrating the first and second error signals;

means for comparing the integrated first error signal with the integrated second pseudo-error signal providing an error correcting signal; and

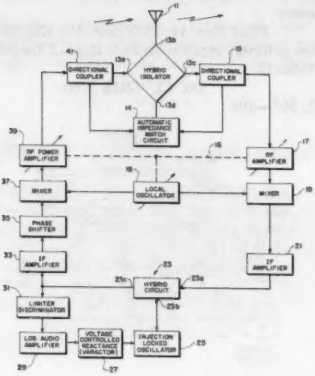
means for controlling the controllable phase shift means with the error connecting signal.

4,218,772

LOCKED-OSCILLATOR REPEATER WITH MODULATION FREQUENCY FEEDBACK

Peter F. Sielman, Huntington; Mario F. Strano, Franklin Square, and Frank J. Tressa, Deer Park, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 28, 1978, Ser. No. 937,295
Int. Cl.[2] H04B *7/14*
U.S. Cl. 455—20 6 Claims



1. A radio frequency repeater comprising receiving means for receiving an incoming signal;

frequency reduction means, electrically in series with said receiving means, for reducing the frequency of a received incoming signal;

a free running injection locked oscillator into which said reduced frequency incoming signal is injected, said oscillator producing an output signal and having a tank circuit containing a voltage controlled reactance which determines the frequency of said injection locked oscillator;

sampling means, electrically coupled to the said injection locked oscillator, for sampling the output signal of said oscillator;

processor means, electrically coupled to said sampling means, for converting the sampled oscillator output to a control voltage, the magnitude of said control voltage being dependent upon the frequency of the sampled oscillator output, and applying said control voltage to the voltage controlled reactance in the tank circuit of the injection locked oscillator thereby causing the free running frequency of said oscillator to follow the frequency of the incoming signal; frequency increasing means, electrically coupled to the output of said injection locked oscillator, for increasing the frequency of the injection locked oscillator output to a desired transmission frequency;

transmitting means, electrically coupled to the output of said frequency increasing means, for transmitting an outgoing signal; and

isolation and coupling means for coupling the reduced frequency incoming signal to the injection locked oscillator and for coupling the output signal from the injection locked oscillator to the processor means and frequency increasing means.

4,218,773

SUPERHETERODYNE RECEIVER OF SCANNING TYPE WITH INDICATOR MEANS TO DISPLAY RECEIVED FREQUENCY AND FREQUENCY BEING STORED IN MEMORY

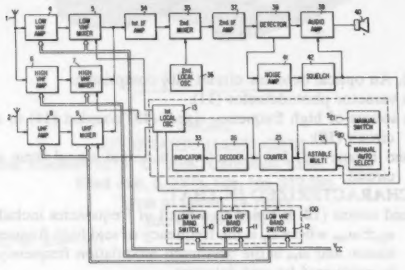
Eigo Imamura, Kusatsu, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Division of Ser. No. 756,831, Jan. 5, 1977, Pat. No. 4,147,987. This application Sep. 22, 1978, Ser. No. 945,095

Claims priority, application Japan, Jan. 19, 1976, 51-6271; May 31, 1976, 51-64798; Jul. 27, 1976, 51-90595; Sep. 14, 1976, 51-111078

Int. Cl.[3] H03J *7/28;* H04B *1/26*

U.S. Cl. 455—159 **2 Claims**



1. A superheterodyne receiver of a scanning type, comprising means for selectively receiving a high frequency signal including a plurality of channels each channel being a different frequency, local oscillator means for providing an oscillation frequency signal the frequency of which is different by a given frequency difference from the frequency of said received high frequency signal, and mixing means responsive to said received high frequency signal and said local oscillation frequency signal for providing an intermediate frequency signal; said local oscillator means comprising:

voltage controlled oscillator means for providing an oscillation frequency signal the oscillation frequency of which is variable as a function of a control voltage,

means for modifying the oscillation frequency of the output from said voltage controlled oscillator means,

read-write storing means for storing coded information concerning the rate of frequency modification of said oscillation frequency modifying means for controlling said oscillation frequency modifying means at a plurality of addresses each corresponding to a said one of said plurality of channels each of said addresses having a plurality of data storage positions, and

means responsive to the output from said oscillation frequency modifying means, as modified at the frequency modification rate of said coded information stored by said storing means for providing a control voltage associated with the frequency of the output from said oscillation frequency modifying means to said voltage controlled oscillator means, whereby said local oscillator means is adapted to provide a local oscillation frequency signal the frequency of which is associated with the frequency modification rate of said coded information, as stored by said storing means, said receiver further comprising:

scanning signal generating means producing a signal for addressing the corresponding addresses of said frequency modification rate storing means for reading out said coded information concerning the frequency modification rate stored in said storing means and thereby scanning the frequencies of said plurality of channels being received by said high frequency signals receiving means for sequentially selecting said plurality of channels, said generating means further providing a distinct signal related to each corresponding addressing signal,

a plurality of indicator means responsive to the respective distinct output from said scanning signal generating means each for displaying an indication of a corresponding channel as the scanning signal generating means addresses a corresponding address of said storage means for reading out the coded information therefrom,

means operatively coupled to said frequency modification rate storing means for writing coded information concerning the frequency modification rate in selected addresses of said storing means, said writing means comprising a plurality of first switching means each being selectively settable at first and second logical levels and each being operatively coupled to a respective data storage position of each of the addresses of said storing means, and

control means for switching the mode of operation of said storing means from one wherein said scanning signal generating means reads the stored coded information to one wherein said writing means writes the information being stored in accordance with the logical levels set by said plurality of first switching means, said control means including means for connecting each of said first switching means to a corresponding one of said indicator means to display the logical level information being written into a respective data storage position of an address of said storing means by a corresponding one of said first switching means.

4,218,774

AUTOMATIC GAIN CONTROL CIRCUIT

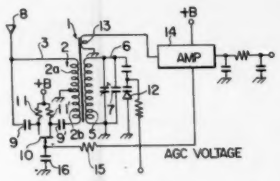
Minoru Kondo, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 965,135

Claims priority, application Japan, Dec. 1, 1977, 52-144510

Int. Cl.[3] H04B *1/18*

U.S. Cl. 455—249 **5 Claims**



1. In a radio receiver of the type including a bar antenna having a primary winding connected to an external antenna, a secondary winding connected to a tuning circuit, and a tertiary winding connected to an amplifier circuit, an improved automatic gain control circuit for protecting the tuning circuit from a large amplitude input radio signal received by said external antenna, said automatic gain control circuit comprising:

variable impedance means in said primary winding; and

feedback means coupled between said primary winding and the output of said amplifier circuit for feeding back to said variable impedance means an automatic gain control signal of the same wave length as said input signal to vary said impedance means such that a large amplitude input signal is attenuated more than a smaller amplitude input signal.

4,218,775

PUSHBUTTON RADIO TUNER WITH ILLUMINATED PUSHBUTTON DISPLAY

Richard S. Cox, Hoffman Estates, and Paul D. McGee, Medinah, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 22, 1978, Ser. No. 918,115

Int. Cl.[2] H04B *1/20;* H03J *1/04*

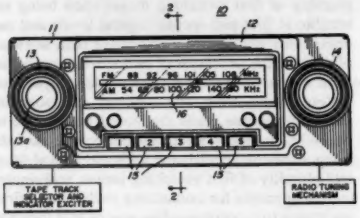
U.S. Cl. 455—344 **24 Claims**

1. A display apparatus for a pushbutton operative device, comprising:

an audio entertainment system device capable of two different types of audio operation

a plurality of manually actuatable pushbuttons mounted to said device, each pushbutton capable of selecting a different operative mode for the device in one type of operation; and

visual display means carried on each of said pushbuttons, each of said visual display means selectively operable to



display the selection of an operative state of said device in the second type of operation, wherein said operative modes selected by manual actuation of said pushbuttons are different from said displayed operative states, and wherein said displayed operative states are unrelated to both the operative modes selected by manual actuation of said pushbuttons and which of said pushbuttons have been manually actuated to select one of said operative modes.

4,218,776

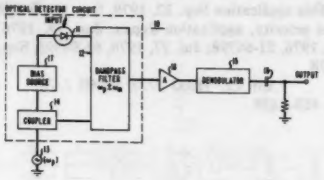
PARAMETRIC OPTICAL DETECTOR

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1979, Ser. No. 26,089

Int. Cl.[2] H04B 9/00

U.S. Cl. 455—619 **4 Claims**



1. An optical detector circuit (10) comprising:

a varactor photodetector (11);

a source of high frequency signal (13) coupled (14) to said circuit (10);

and means (12) for extracting an output signal from said circuit;

CHARACTERIZED IN THAT:

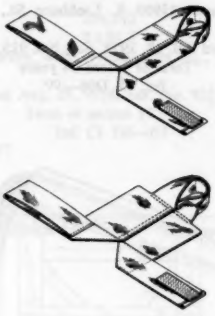
said means (12) is tuned to a band of frequencies including $\omega_p \pm \omega_m$, where ω_p is the frequency of said high frequency source and ω_m is the maximum modulation frequency to be recovered by said detector.

DESIGNS

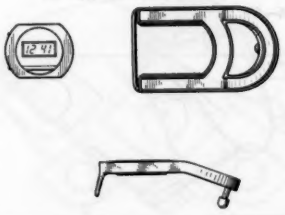
AUGUST 19, 1980

256,400
SHOE SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Sep. 19, 1977, Ser. No. 834,424
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

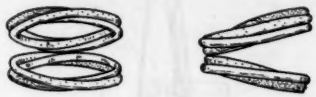
256,401
GYMNASTS HAND GRIP
Karen Adams, 1017½ "C" Ave., Coronado, Calif. 92118
Filed Jun. 5, 1978, Ser. No. 912,584
Term of patent 14 years
Int. Cl. D02—*06*
U.S. Cl. D2—361



256,402
COMBINED BUCKLE AND SLIDABLY REMOVABLE WATCH
Takayuki Okura, Tokyo, and Seiki Ishimatsu, Kawaguchi, both of Japan, assignors to Nippon Martin Co., Ltd., Tokyo, Japan
Filed Oct. 21, 1977, Ser. No. 844,485
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—406



256,403
SCARF-RING
Robert Hocq, Boulogne-Billancourt, France
Filed Apr. 21, 1978, Ser. No. 898,856
Claims priority, application France, Oct. 21, 1977, 77 76058
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—439

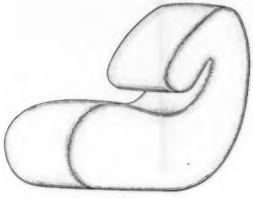


256,404
SUPPORT LEG FOR ADJUSTABLE CRUTCH
Bent Barfod, Højtoftevej 16, Risskov, Denmark (DK-8240)
Filed Jun. 13, 1978, Ser. No. 915,330
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D3—10

256,405
CARRIER FOR WIRE GARMENT HANGERS
Raymond R. Wheeler, 39, Nixon St., Hamilton, New Zealand
Filed May 12, 1978, Ser. No. 905,247
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—30

256,406
COMBINED STORAGE AND DISPENSING CONTAINER FOR SAND OR THE LIKE
Roger L. Veilleux, 67 S. Whitney St., Hartford, Conn. 06106
Filed May 22, 1978, Ser. No. 908,100
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30

256,407
ADJUSTABLE LOUNGE SEAT
Ahmet S. Nakisbendi, Park Manor Dr., Philadelphia, Pa. 19144
Filed Oct. 21, 1977, Ser. No. 844,502
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—37

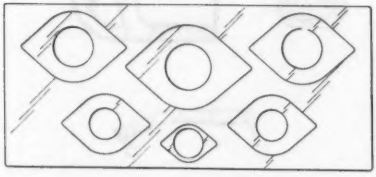


256,408
ADJUSTABLE LOUNGE SEAT
Ahmet S. Nakisbendi, Park Manor Dr., Philadelphia, Pa. 19144
Filed Oct. 21, 1977, Ser. No. 844,503
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—37

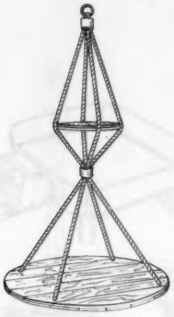
256,409
CHAIR
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Mar. 16, 1978, Ser. No. 887,158
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

256,410
RING HOLDER
Marleen V. Runco, 15909 E. Lashburn St., Whittier, Calif. 90603
Filed Jul. 10, 1978, Ser. No. 923,030
Term of patent 14 years
Int. Cl. D06—*99*
U.S. Cl. D6—85

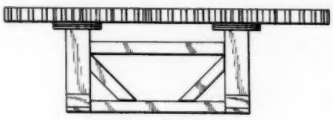
256,411
HOLDER FOR SQUEEZABLE TUBES
Lewis Neuman, 45 Duke St., Paramus, N.J. 07666
Filed Oct. 23, 1978, Ser. No. 953,842
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—87



256,412
TABLE
Carl H. Hovanec, 1713 Oak St., Flint, Mich. 48505
Filed Jan. 23, 1978, Ser. No. 871,466
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—113



256,413
TABLE
Howard M. Barnes, 4905 Washington Sq., Oklahoma City, Okla. 73135
Filed Aug. 28, 1978, Ser. No. 937,441
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



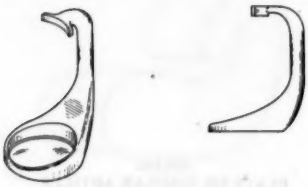
256,414
STUFFED ANIMAL FIGURE AND PILLOW
Lucille M. Rich, 1808 Euclid Ave., Mount Prospect, Ill. 60056
Filed Mar. 31, 1978, Ser. No. 892,483
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—203

256,415
PILLOW CASE
Winifred B. Newman, 360 Paseo Encinal, San Antonio, Bexar County, Tex. 78212, assignor to Winifred Barnum Newman, San Antonio, Tex.
Filed Oct. 20, 1977, Ser. No. 844,129
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—269

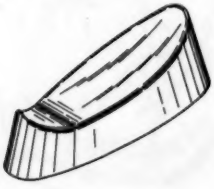
256,416
PLATE OR SIMILAR ARTICLE
James S. Thompson, 10616 Dunkirk Dr., Silver Spring, Md. 20902
Filed Mar. 1, 1978, Ser. No. 882,429
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—23

256,417
COVER FOR A BOWL OR THE LIKE
Richard W. Greger, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jun. 19, 1978, Ser. No. 916,569
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—40

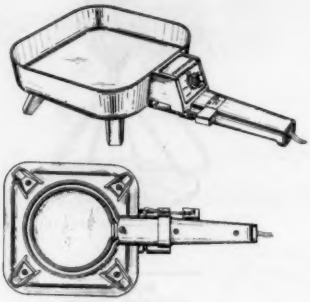
256,418
ATTACHABLE CAN HANDLE OR SIMILAR ARTICLE
William L. Corbett, 7402 Frazier La., Wichita, Kans. 67212
Filed May 19, 1978, Ser. No. 907,863
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—70



256,419
SPOON DISPLAY STAND
Margaret Hom, 11521 Ohio Ave., Los Angeles, Calif. 90025
Filed Nov. 23, 1977, Ser. No. 854,108
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—73



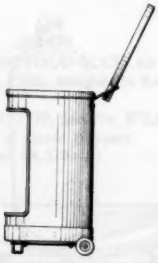
256,420
ELECTRIC SKILLET
Harold W. Rice, Hartsburg, and Rex L. Notbohm, Columbia, both of Mo., assignors to McGraw-Edison Company, Elgin, Ill.
Filed May 25, 1978, Ser. No. 909,718
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—94



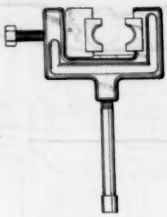
256,421
SAUCE PAN
Dennis J. Dricken, and Arthur J. Schmitt, both of West Bend, Wis., assignors to Dart Industries, Inc., Los Angeles, Calif.
Filed Dec. 19, 1977, Ser. No. 861,584
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—95

256,422
KNIFE
James S. Thompson, 10616 Dunkirk Dr., Silver Spring, Md. 20902
Filed Mar. 1, 1978, Ser. No. 882,428
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—150

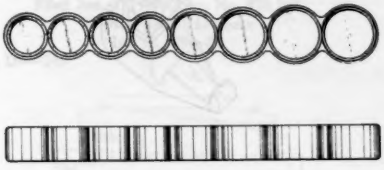
256,423
HAMPER
Stephen A. Bacskay, Bloomingdale, and Sidney Messeri, West Orange, both of N.J., assignors to Outlook in Plastics Corporation, Inc. and Tingue, Brown & Co.
Filed Mar. 17, 1978, Ser. No. 887,592
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—163



256,424
TOOL FOR CRIMPING A RIGID COUPLING ON A FLEXIBLE HOSE
Jerry W. Hamilton, DeSoto, Tex., assignor to Automatic Tool Company, Inc., Ferris, Tex.
Filed Mar. 3, 1978, Ser. No. 883,003
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



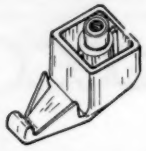
256,425
SOCKET WRENCH HOLDER
John T. Hayes, South Natick, Mass., assignor to Cornwell Tools Company, S. Natick, Mass.
Filed Jan. 3, 1978, Ser. No. 866,490
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



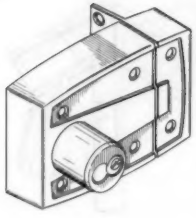
256,426
SAW CHAIN SHARPENING FIXTURE
Frank J. Aksamit, W. Hartford, Conn., assignor to Pro Sharp Corporation
Filed Jan. 3, 1978, Ser. No. 866,475
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91

256,427
FOLDING HUNTING KNIFE
James B. Lile, Rte. 1, Russellville, Ark. 72801
Filed Feb. 6, 1978, Ser. No. 875,603
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99

256,428
HINGE FOR A VEHICLE SUNROOF ASSEMBLY
Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Ferndale, Mich.
Filed Apr. 12, 1978, Ser. No. 895,778
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323



256,429
RIM LOCK
Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.
Filed Jul. 13, 1978, Ser. No. 924,457
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—341

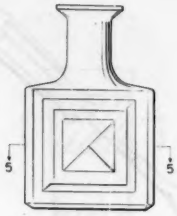


256,430
BOTTLE
Emiliano L. Peña, Barrio de la Estación, Fuenmayor, Logroño, Spain
Filed Nov. 25, 1977, Ser. No. 854,992
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

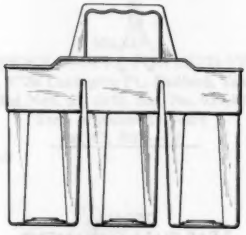
256,431
BOTTLE
Paul R. Campbell, Cincinnati, Ohio, and John Pardo, Yonkers, N.Y., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 15, 1978, Ser. No. 905,930
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

256,432
BOTTLE OR SIMILAR ARTICLE
Everett C. Beeman, Wallingford, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Jun. 1, 1978, Ser. No. 912,167
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

256,433
DECANTER
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed May 1, 1978, Ser. No. 901,970
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—159

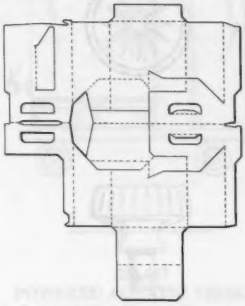


256,434
BOTTLE CARRYING CASE
Marcel E. A. O'Donnal, San Andres Atoto 6, Naucalpan de Juarez, Edo. de Mexico, Mexico
Filed May 10, 1978, Ser. No. 904,637
Claims priority, application Mexico, Nov. 10, 1977, 1770
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—176

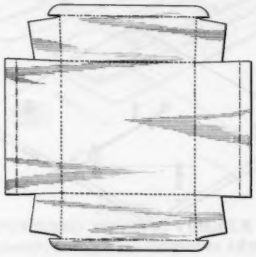


256,435
CONTAINER FOR FOOD SUCH AS TACOS
Joe R. Payne, La Habra, Calif., assignor to Keyes Fibre Company
Filed Jan. 25, 1978, Ser. No. 872,319
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182

256,436
ARTICLE CARRIER BLANK
James T. Stout, Acworth, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 22, 1978, Ser. No. 963,005
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



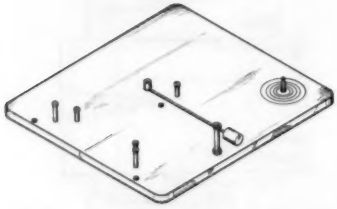
256,437
TRAY BLANK
Rudolph A. Faller, Edina, and William M. Tolaas, Shore View, both of Minn., assignors to Champion International Corporation, Stamford, Conn.
Filed Jan. 17, 1978, Ser. No. 870,262
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



256,438
CABLE TIE
Bernard F. Woods, St. Clair Shores, Mich., assignor to Electro-Wire Products, Inc., Troy, Mich.
Filed Oct. 3, 1977, Ser. No. 838,924
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—252

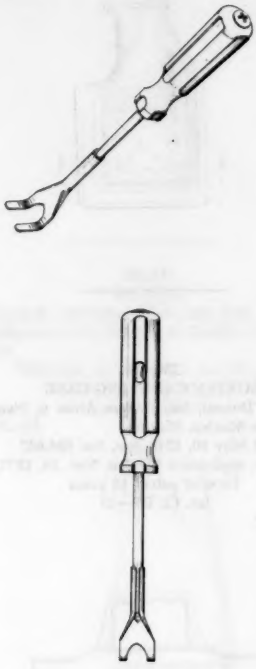
256,439
STOPPER
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Oct. 27, 1978, Ser. No. 955,422
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—285

256,440
SOLAR RADIATION MEASURING APPARATUS
Thomas S. Ashley, III; Harold A. Blum, and Charles S. Moore, all of Dallas, Tex., assignors to Devices & Services Company, Dallas, Tex.
Filed Sep. 29, 1977, Ser. No. 837,919
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—47



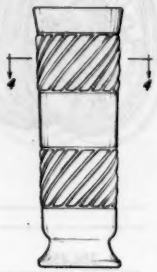
256,441
SPIRIT LEVEL
Michel Quenot, Besancon, France, assignor to Stanley-Mabo S.A.
Filed Sep. 25, 1978, Ser. No. 945,598
Claims priority, application France, Feb. 16, 1978, 78 1173
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69

256,442
HAND TOOL FOR INDUCTIVELY TESTING CONTINUITY IN ELECTRICAL IGNITION SYSTEMS AND FOR REMOVING SPARK PLUG BOOTS
George G. Martin, 1743 Walnut Rd., Kent, Ohio 44240
Filed Dec. 21, 1977, Ser. No. 863,331
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—77

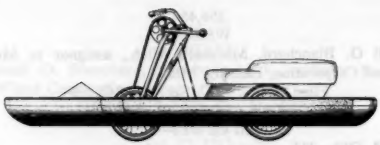


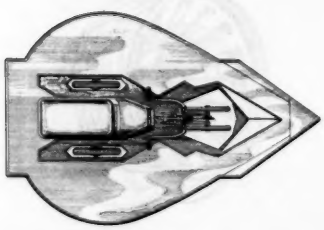
256,443
LEAF WALL ORNAMENT
Donald R. Ditto, Rte. #2, Box #60F2, Winnsboro, Tex. 75494
Filed Aug. 9, 1978, Ser. No. 932,684
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

256,444
FLOWER VASE
Martin J. Waterfield, Birmingham, Mich., assignor to Florists' Transworld Delivery Association
Filed Jul. 2, 1979, Ser. No. 54,189
Term of patent 7 years
Int. Cl. D11—*02*; D7—*01*
U.S. Cl. D11—146

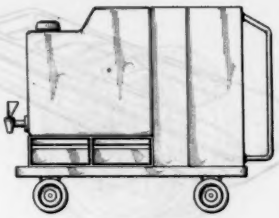


256,445
AMPHIBIOUS PEOPLE POWERED VEHICLE
Alton Hudnall, 1720 Lexington Pl., Bedford, Tex. 76021
Filed Nov. 13, 1978, Ser. No. 959,491
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—3

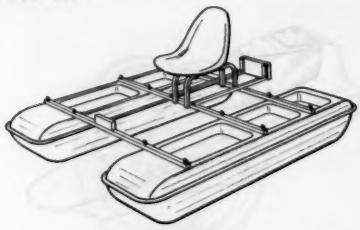




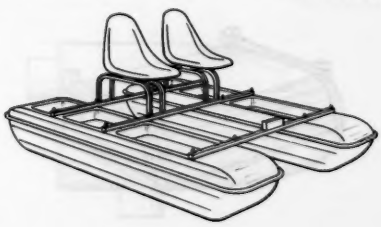
256,446
UTILITY CART FOR CLEANING EQUIPMENT
Wayne M. Hultberg, Glenview, Ill., assignor to Huntington Laboratories Inc.
Filed Apr. 17, 1978, Ser. No. 897,295
Term of patent 7 years
Int. Cl. D12—*02*
U.S. Cl. D12—28



256,447
POWERED AQUATIC VEHICLE
Lonnie W. Upchurch, Irving, Tex., assignor to Advanced Marine Concepts, Inc., Arlington, Tex.
Filed Apr. 7, 1978, Ser. No. 894,626
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



256,448
POWERED AQUATIC VEHICLE
Lonnie W. Upchurch, Irving, Tex., assignor to Advanced Marine Concepts, Inc., Arlington, Tex.
Filed Apr. 7, 1978, Ser. No. 894,627
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



256,449

PONTOON FOR AN AQUATIC VEHICLE AND THE LIKE

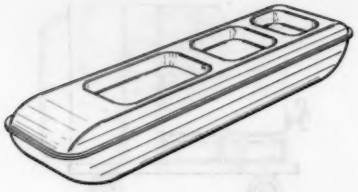
Lonnie W. Upchurch, Irving, Tex., assignor to Advanced Marine Concepts, Inc., Arlington, Tex.

Filed Apr. 7, 1978, Ser. No. 894,625

Term of patent 14 years

Int. Cl. D12—*06*

U.S. Cl. D12—70



256,450

MOTORCYCLE SIDE CAR

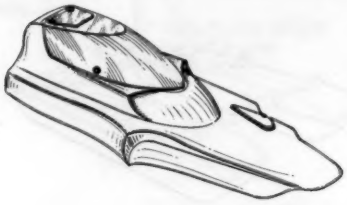
Ghraydon L. Wallick, Laguna Beach, Calif., assignor to Clarence H. Wallick

Filed May 30, 1978, Ser. No. 910,660

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—116



256,451

CAP FOR THE BED OF A PICKUP TRUCK

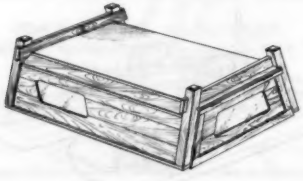
George H. Verry, and Loring T. Verry, both of 167 Buttonwood St., Halifax, Mass. 02338

Filed Jun. 6, 1978, Ser. No. 913,254

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—156



256,452

WHEEL

Douglas F. Wolff, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 7, 1977, Ser. No. 840,270

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—204

256,453

WHEEL CENTER

Adrianus J. De Graaff, Irenestraat 4A, Wilnis, Netherlands

Filed Nov. 21, 1977, Ser. No. 853,636

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—205

256,454

WHEEL

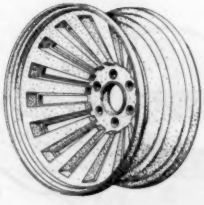
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 7, 1977, Ser. No. 840,269

Term of patent 14 years

Int. Cl. D12—*16*

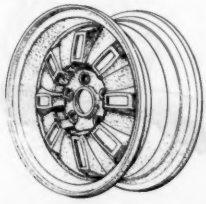
U.S. Cl. D12—211



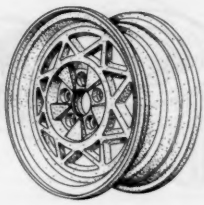
256,455
WHEEL
Douglas F. Wolff, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,502
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

256,456
WHEEL
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,509
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

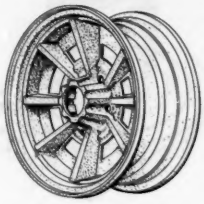
256,457
WHEEL
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,510
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



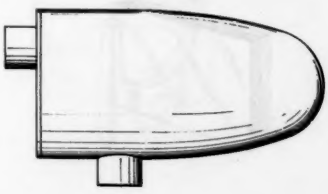
256,458
WHEEL
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,511
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



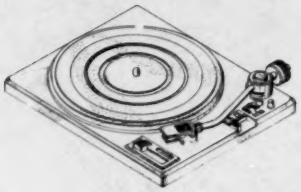
256,459
WHEEL
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,512
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



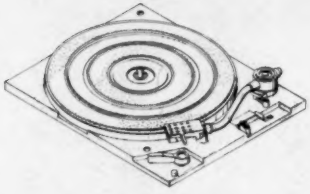
256,460
MOTOR HOUSING FOR ROTATING EMERGENCY VEHICLE WARNING LIGHT
Richard V. Slepetz, 722 Park Ave., Herndon, Va. 22070
Filed Apr. 12, 1978, Ser. No. 895,874
Term of patent 14 years
Int. Cl. D13—*01;* D10—*06*
U.S. Cl. D13—2



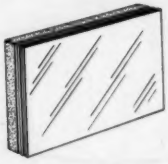
256,461
RECORD TURNTABLE
Claude Guillon, Bougival, France, assignor to Thomson-Brandt, Paris, France
Filed Jan. 23, 1978, Ser. No. 871,578
Claims priority, application France, Jul. 22, 1977, 77 75867
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25



256,462
RECORD TURNTABLE
Raymond Vachus, Yzeure, France, assignor to Thomson-Brandt, Paris, France
Filed Jan. 23, 1978, Ser. No. 871,579
Claims priority, application France, Jul. 22, 1977, 77 75867
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25



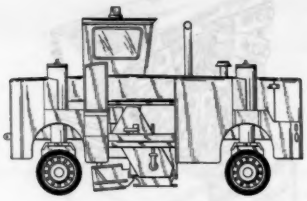
256,463
SPEAKER OR SIMILAR ARTICLE
Lester M. Barcus, 16226 Wayfarer La., Huntington Beach, Calif. 02649, and John F. Berry, 3392 St. Albans Dr., Los Alamitos, Calif. 90720
Filed Aug. 26, 1977, Ser. No. 828,241
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—33



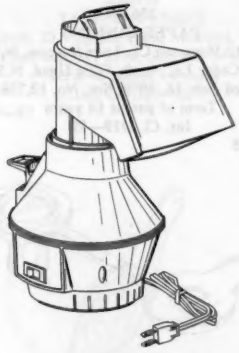
256,464
WALL TELEPHONE SET
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Dec. 2, 1977, Ser. No. 856,800
Claims priority, application Sweden, Jun. 17, 1977, 77001351
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—56

256,465
TELEPHONE STATION HANDSET
Daniel W. Tyler, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jul. 31, 1978, Ser. No. 929,434
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—63

256,466
ROAD PLANING MACHINE
Donald W. Smith, Edmond, and Larry W. Teel, Yukon, both of Okla., assignors to CMI Corporation, Oklahoma City, Okla.
Filed Aug. 31, 1978, Ser. No. 938,414
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—22



256,467
CORN POPPING APPARATUS
Marshall B. Johnson, Chillicothe; Donald E. Watkins, Parma, and Robert A. Williams, Chillicothe, all of Ohio, assignors to Wear-Ever Aluminum, Inc.
Filed Jan. 20, 1978, Ser. No. 871,165
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—105



256,468
PHOTOGRAPHIC CAMERA
Norbert Schlagheck, and Herbert Schultes, both of Fuerstenfeldbruck, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany
Filed Aug. 25, 1977, Ser. No. 827,730
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 5510
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—01

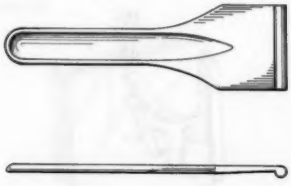
256,469
COLLAPSIBLE CINEMATOGRAPHIC CAMERA
Otto Stemme, Munich, and Peter Lermann, Narring, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany
Filed Feb. 22, 1978, Ser. No. 880,864
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—04

256,470
HOLDER FOR MICROSCOPE SLIDES
Alan J. Gordon, Liverpool, England, assignor to Shandon Southern Products Limited, Cheshire, England
Filed Mar. 8, 1978, Ser. No. 884,600
Claims priority, application United Kingdom, Sep. 15, 1977, 981530/77
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—50

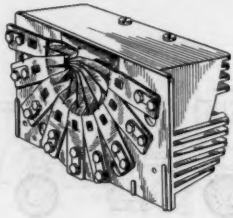
256,471
GUITAR STRING TUNING MACHINE
Robert J. Spercel, 3214 W. 139 St., Cleveland, Ohio 44111
Filed Sep. 29, 1977, Ser. No. 838,115
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

256,472
CASE FOR AN ELECTRONIC CALCULATOR
Eugene J. Sulek, and William J. Lawrence, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Mar. 6, 1978, Ser. No. 884,344
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

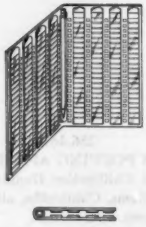
256,473
CREDIT CARD IMPRINTER
Jerome Wagner, 19250 Prairie St., Northridge, Calif. 91324
Filed Sep. 11, 1978, Ser. No. 941,045
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—14



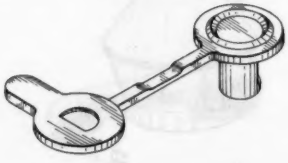
256,474
PRINTING HEAD FOR A DOT MATRIX PRINTER
Sven G. V. Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag
Continuation-in-part of Ser. No. D. 785,932, Apr. 8, 1977, abandoned. This application Jun. 20, 1979, Ser. No. 50,446
Claims priority, application Sweden, Oct. 11, 1976, 76-1965
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—22



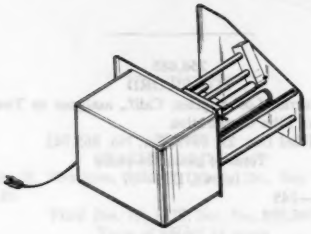
256,475
COMBINED SHOPPING LIST FOLDER AND WRITING INSTRUMENT
Delores G. McDanles, 10509 4th Ave., Inglewood, Calif. 90303
Filed Nov. 30, 1978, Ser. No. 964,875
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



256,476
PAPER BINDING
Eugene Gerber, 12 Hampton Ct., Lake Success, N.Y. 11020, and Sol Zaret, 11 Cedar La. North, Glen Head, N.Y. 11545
Filed Feb. 16, 1979, Ser. No. 12,758
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—65

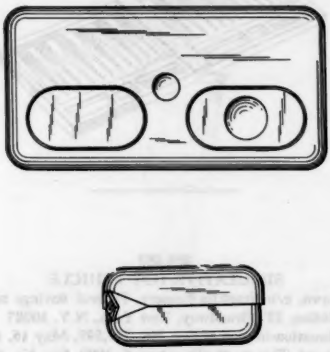


256,477
LABEL DISPENSING MACHINE
Allen H. Oglander, 9 Sackston Woods, St. Louis County, Mo. 63141
Filed Feb. 8, 1978, Ser. No. 876,182
Term of patent 3½ years
Int. Cl. D19—*02*
U.S. Cl. D19—67

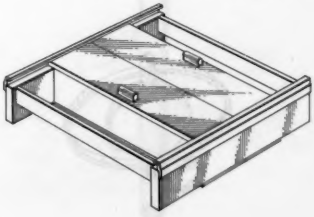


256,478
TAPE DISPENSER
Donald M. Groff, 23 Virginia Trail, Medford, N.J. 08055
Filed Sep. 18, 1978, Ser. No. 944,629
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—67

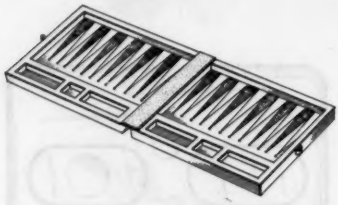
256,479
PERFORATOR
Christoph Manusch, Hanover, Fed. Rep. of Germany, assignor to Pelikan A.G., Hanover, Fed. Rep. of Germany
Filed Sep. 27, 1978, Ser. No. 946,533
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—72



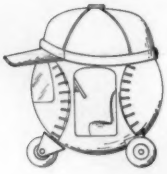
256,480
STORAGE BOX WITH SLIDING LIDS
John O. Wright, 35 Heybridge St., Manurewa, Auckland, New Zealand
Filed Jan. 5, 1978, Ser. No. 867,357
Claims priority, application New Zealand, Jul. 6, 1977, 15050
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



256,481
BACKGAMMON BOARD
Bruce G. Zemby, 1067 Tamarisk Rd., Palm Springs, Calif. 92262
Filed Sep. 11, 1978, Ser. No. 941,416
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—16

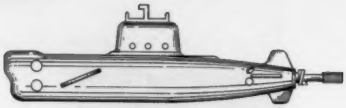


256,482
SIMULATIVE TOY VEHICLE
Ruth Brown, c/o Franklin Society, Federal Savings and Loan Association, 217 Broadway, New York, N.Y. 10007
Continuation-in-part of Ser. No. 797,595, May 16, 1977, abandoned. This application Aug. 6, 1979, Ser. No. 63,983
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D21—80



256,483
TOY SPINNER OR SIMILAR ARTICLE
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Continuation-in-part of Ser. No. 787,076, Apr. 13, 1977. This application Jan. 17, 1979, Ser. No. 4,158
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—93

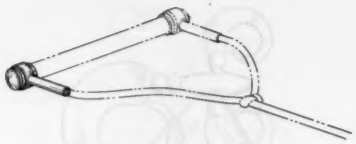
256,484
TOY SUBMARINE
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed Nov. 14, 1977, Ser. No. 851,531
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130



256,485
TOY SWORD
Ralph McQuarrie, Los Angeles, Calif., assignor to Twentieth Century-Fox Film Corporation
Filed Dec. 29, 1977, Ser. No. 865,742
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—145

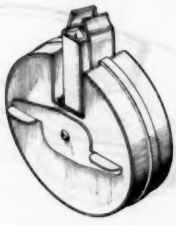
256,486
HAND HELD SKIING STABILIZER OR SIMILAR ARTICLE
Jacques Ducourant, P.O. Box 518, Draper, Utah 84020
Filed May 8, 1978, Ser. No. 903,978
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

256,487
PROTECTIVE END CAP FOR WATER SKI TOW ROPE HANDLES
Alan K. Pittman, 19437 Stagg St., Reseda, Calif. 91335
Filed Nov. 24, 1978, Ser. No. 963,559
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

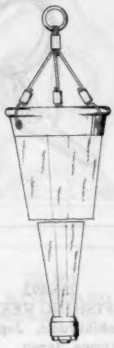


256,488
SKATEBOARD RAMP
Douglas B. Firestone, 9389 F Dowdy Dr., San Diego, Calif. 92126
Filed Jan. 10, 1978, Ser. No. 868,307
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—242

256,489
GUN MAGAZINE FOR A SEMI-AUTOMATIC GUN
Earl W. Stokes, 3620 Roosevelt Dr., Arlington, Tex. 76101
Filed Mar. 28, 1978, Ser. No. 891,155
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



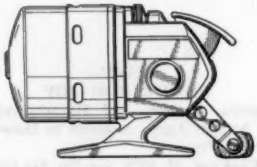
256,490
PLANKTON NET
Harold E. Schlichting, Jr., 151 S. Ridge St., Village of Port Sanilac, Mich. 48469
Filed Oct. 25, 1977, Ser. No. 845,167
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22



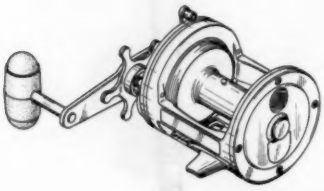
256,491
FISHING ROD GRIP
Hideo Nakamura, Koganei, and Hayashi Aoyama, Higashikurume, both of Japan, assignors to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Sep. 20, 1978, Ser. No. 944,215
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

256,492
LINE GUIDE
Shigeru Yamamoto, Higachikurume, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Mar. 1, 1979, Ser. No. 16,618
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

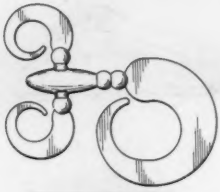
256,493
FISHING REEL
Kiyoshi Okada, Higashikurume, Japan, assignor to Daiwa Seiko, Inc., Higashikurme, Japan
Filed Aug. 9, 1978, Ser. No. 932,166
Claims priority, application Japan, Jun. 8, 1978, 53-23752
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



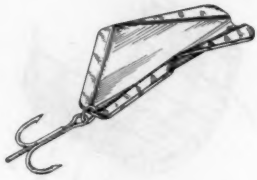
256,494
FISHING REEL
Kiyoshi Okada, Higashikurume, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Sep. 29, 1978, Ser. No. 947,230
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



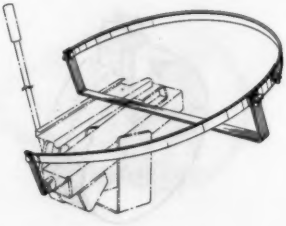
256,495
FISHING LURE OR SIMILAR ARTICLE
Linda J. Brown, Rte. 1, Box 126P, P.O. Box 70, Pearcy, Ark. 71964
Filed May 4, 1979, Ser. No. 36,135
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



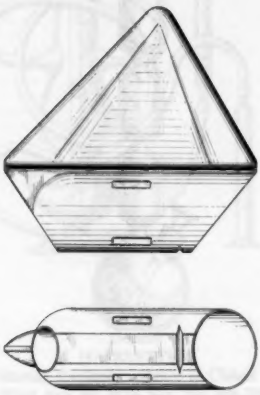
256,496
ADJUSTABLE FISH LURE
Arnold N. Jacobson, 1535 Big Horn Ave., Sheridan, Wyo. 82801
Filed Sep. 13, 1978, Ser. No. 942,173
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—29



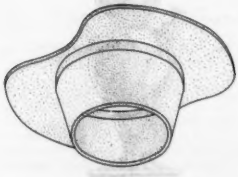
256,497
PERIMETER RING FOR TARGET THROWING TRAP
Kenneth C. Rowlands, Utica, and John P. Linde, Richfield Springs, both of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.
Filed Feb. 6, 1978, Ser. No. 875,610
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—99



256,498
SWIMMING POOL FLOATING DISPENSER
Robert J. Kennedy, Plano, Tex., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Dec. 26, 1978, Ser. No. 972,842
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

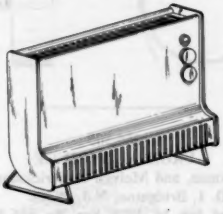


256,499
WATER CLOSET SEAL
James L. Foreman, 1124 Stillman Ave., East Gadsden, Ala. 35903
Filed Jul. 28, 1978, Ser. No. 928,860
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—47

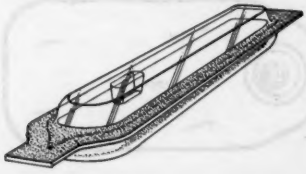


256,500
FREE STANDING FIREPLACE
Richard B. Johnson, 10343 Pico Vista Rd., Downey, Calif. 90241
Filed Nov. 9, 1978, Ser. No. 959,372
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

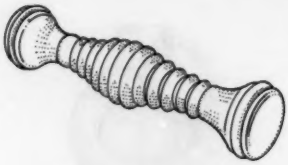
256,501
ELECTRIC BASEBOARD HEATER
Dov Z. Glucksman, 43 Norwood Ave., Newton Centre, Mass. 02159
Continuation-in-part of Ser. No. 706,220, Jul. 15, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,629
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—122



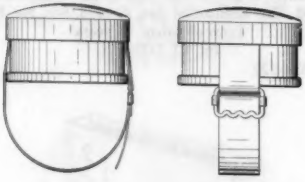
256,502
CAPSULE FOR TWO-COMPONENT PREPARATIONS
Bo I. B. Borg, Södertälje; Arne T. Eek, Trosa, and Axel B. Persson, Lund, all of Sweden, assignors to Astra Läkemedel Aktiebolag, Södertälje, Sweden
Filed Dec. 27, 1977, Ser. No. 864,929
Claims priority, application Sweden, Jul. 4, 1977, 771465
Term of patent 14 years
Int. Cl. D24—*02*; D9—*04*
U.S. Cl. D24—17



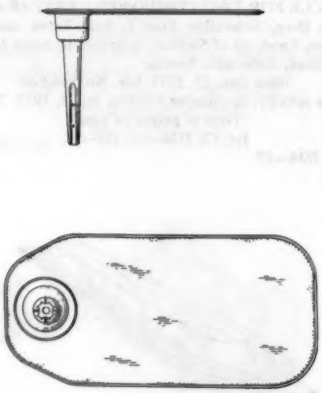
256,503
FOOT MASSAGER
Robert H. Moustakas, P.O. Box 8010, Ann Arbor, Mich. 48107
Filed Mar. 6, 1978, Ser. No. 884,047
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—36



256,504
HAND ENGAGEABLE CARDIO-PULMONARY RESUSCITATIVE DEVICE OR THE LIKE
Belford L. Davis, Jacksonville, Fla., assignor to Cardiaconcepts Corporation, Jacksonville, Fla.
Filed Jan. 9, 1978, Ser. No. 868,135
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41



256,505
VAGINAL SYRINGE
Robert L. Strickman, and Melvyn B. Strickman, both of Lawrence Rd., R.D. 1, Bridgeton, N.J. 08302
Filed Jun. 16, 1978, Ser. No. 916,307
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—60

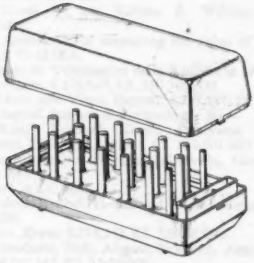


256,506
SMOKING DEVICE
Roger A. Graham, 721 Chesapeake Ave., Silver Spring, Md. 20910
Filed Nov. 14, 1978, Ser. No. 960,758
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

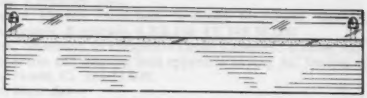
256,507
SMOKING DEVICE
Roger A. Graham, 721 Chesapeake Ave., Silver Spring, Md. 20910
Filed Nov. 14, 1978, Ser. No. 960,759
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

256,508
SMOKING DEVICE
Roger A. Graham, 721 Chesapeake Ave., Silver Spring, Md. 20910
Filed Nov. 14, 1978, Ser. No. 960,760
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

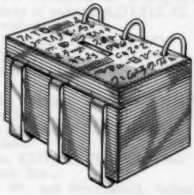
256,509
HAIRSETTER
John Ryan, Stames, England, assignor to Clairol Incorporated
Filed Apr. 10, 1978, Ser. No. 894,785
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—38



256,510
MOTORCYCLE TAIL LIGHT
George H. Swartz, Jr., 753 Mahan Rd., Aberdeen, Md. 21001, and Drema A. Mullican, 3202 White Ave., Baltimore, Md. 21214
Filed Mar. 17, 1978, Ser. No. 887,640
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—28



256,511
BANK
J. Ralph Atkin, 477 Damascus Dr., Bloomington, Utah 84770
Filed Jul. 12, 1978, Ser. No. 923,888
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—35



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF AUGUST, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co., Inc.: *See*—
Ramsay, Charles F., 4,217,714, Cl. 40-549.000.

A-T-O, Inc.: *See*—
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., 4,218,690, Cl. 340-149.00R.

A. Y. McDonald Mfg. Co.: *See*—
Eckel, John D., 4,218,042, Cl. 251-288.000.

AB Kabi: *See*—
Joensson, Aake N.; Kempe, Tomas G.; Mikiver, Lembit; and Sparf, Bengt A., 4,218,472, Cl. 424-316.000.
Joensson, Aake N.; Merenyi, Ferenc; Moses, Pinchas; Karlsson, Lennart E.; and Hanshoff, Gunnar, 4,218,476, Cl. 424-321.000.

Abbott Laboratories: *See*—
Carney, Ronald E.; DeVault, Robert L.; McAlpine, James B.; and Sinclair, Arthur C., 4,218,441, Cl. 424-180.000.
McAlpine, James B.; and Carney, Ronald E., 4,218,442, Cl. 424-180.000.
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,218,562, Cl. 536-17.00R.

Abe, Michio, to Tokai TRW & Co., Ltd. Rack and pinion type steering gear. 4,217,793, Cl. 74-499.000.

Abo El-Nil, Mostafa M., to Weyerhaeuser Company. Embryogenesis of gymnosperm forest trees. 4,217,730, Cl. 47-58.000.

Abolins, Visvaldis: *See*—
Cooper, Glenn D.; and Abolins, Visvaldis, 4,218,364, Cl. 260-45.70P.

Abts, Leigh R., to Micro Pure Systems, Inc. Ultrasonic particulate sensing. 4,217,781, Cl. 73-632.000.

Abu-Akeel, Abdulhadi K.; Barrowman, Thomas; and Rieck, Gerald C., to General Motors Corporation. Guide device for multi-axis manipulator. 4,218,166, Cl. 414-1.000.

Ache, Richard P.; Gartner, Stanley; and Nissen, Alexandre, to GTE Products Corporation. Coil winding machine. 4,217,937, Cl. 140-92.100.

Ackerman, Roy A. Method for growing a deammonifying culture and use thereof in wastewater treatment. 4,218,540, Cl. 435-243.000.

Ackerman, Roy A. Converting urea with bacteria. 4,218,541, Cl. 435-262.000.

Ackermann, William, to United Technologies Corporation. Rotary seal. 4,218,066, Cl. 277-53.000.

Acquaviva, Pompeli F. Street sign structure. 4,217,716, Cl. 40-607.000.

Advocart, Inc.: *See*—
Spresser, Howard L.; and Miller, Darrell W., 4,217,711, Cl. 40-308.000.

Aerodyne Research, Inc.: *See*—
Kryger, David L.; and Killam, R. William, 4,218,142, Cl. 356-394.000.

Agar, Joram. Apparatus for measuring the value of a fluid variable. 4,217,774, Cl. 73-32.00A.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Cazaux, Jacques, 4,218,617, Cl. 250-305.000.
Henault, Marc; and Vitter, Gerard, 4,218,297, Cl. 204-195.00S.

Agency of Industrial Science & Technology: *See*—
Ohashi, Kanji; Kontani, Kazuo; Uchiyama, Yoshitada; and Motohashi, Kinichi, 4,217,871, Cl. 123-501.000.
Sasaki, Kanji; Suehiro, Tetsuro; and Okada, Akira, 4,218,321, Cl. 210-259.000.

AGFA-Gevaert, A.G.: *See*—
Bauer, Walter; Krobel, Heinz; and Muller, Jurgen, 4,218,054, Cl. 271-11.000.
Biedermann, Ernst, 4,218,133, Cl. 355-56.000.
Escales, Eberhard; Hell, August; Schubert, Andreas; and Weber, Klaus, 4,217,743, Cl. 53-54.000.
Krobel, Heinz; and Bauer, Walter, 4,218,055, Cl. 271-106.000.
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.
Viehrig, Wolfgang; and Sperber, Werner, 4,218,123, Cl. 354-310.000.

Aichert, Hans: *See*—
Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, 4,218,410, Cl. 264-8.000.

Aid, James D.; and Lee, Kyu H., to Extracorporeal Medical Specialties, Inc. Dialysis apparatus and technique. 4,218,313, Cl. 210-22.00A.

Aihara, Katsuzo: *See*—
Tada, Naofumi; and Aihara, Katsuzo, 4,218,668, Cl. 335-216.000.

Air Resources, Inc.: *See*—
Thompson, Ralph B., 4,218,342, Cl. 252-431.00C.

Aisin Seiki Kabushiki Kaisha: *See*—
Masuda, Noboru; and Suzuki, Mitsuyuki, 4,217,779, Cl. 73-313.000.
Watanabe, Tsukasa, 4,218,670, Cl. 337-349.000.

Ajinomoto Company, Incorporated: *See*—
Takeuchi, Koji; Zama, Takashi; and Iwai, Shizuo, 4,218,261, Cl. 106-111.000.
Takeuchi, Kouji; Nakamura, Masao; Kitamura, Nobuyoshi; and Matsuura, Shohachi, 4,218,352, Cl. 260-23.0XA.

Akaba, Hayao; Ikeda, Akira; and Lee, Masayoshi, to Kabushiki Kaisha Hoya Lens. Method for automatically grinding lenses. 4,217,736, Cl. 51-284.00E.

Akamatsu, Katsutaro: *See*—
Hiraishi, Hisashi; Morichika, Toshiaki; Murakami, Shinichi; and Akamatsu, Katsutaro, 4,218,268, Cl. 148-38.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. AC Feeding apparatus and rotating field apparatus having AC feeding apparatus. 4,218,646, Cl. 322-72.000.

Akitsuki, Ikuo: *See*—
Itoh, Takuji; and Akitsuki, Ikuo, 4,218,308, Cl. 208-143.000.

Aktiebolaget Svenska Flaktfabriken: *See*—
Stterdal, Edgar, 4,218,188, Cl. 416-172.000.

Akzo NV: *See*—
Van Ooij, Willy J., 4,218,517, Cl. 428-614.000.

Albert, Albert F.: *See*—
Fort, Leonard N.; Albert, Albert F.; and Darragh, Edward P., 4,217,862, Cl. 123-472.000.

Albright, Charles W.; and Davis, H. G., to Union Carbide Corporation. Method of avoiding agglomeration in fluidized bed processes. 4,218,287, Cl. 201-9.000.

Aldhous, Christopher J.: *See*—
Gee, Lawrence F.; Jarvis, Denis B.; and Aldhous, Christopher J., 4,218,693, Cl. 357-41.000.

Aldrich, Paul E.; and Berezin, Gilbert H., to Du Pont de Nemours, E. I., and Company. Antihypertensive polyfluorohydroxyisopropyl bicyclic and tricyclic carbostyrils. 4,218,448, Cl. 424-244.000.

Alexander, James E. Adjustable weight balancing device for a backpack frame. 4,217,998, Cl. 224-261.000.

Alexander Wiegand GmbH & Co. Armaturen- und Manometerfabrik: *See*—
Neubeck, Kurt; and Julien, Hermann, 4,217,784, Cl. 73-732.000.

Alfio, Deregibus, to Goodyear Tire & Rubber Company, The. Extracting core from hose. 4,218,419, Cl. 264-334.000.

Allemann, James G., to Norris Industries, Inc. Anti-friction latch insert and fastening means. 4,218,082, Cl. 292-173.000.

Allen, Francis K.; and Chin, Victor H., to International Business Machines Corporation. Parallel-to-serial binary data converter with multiphase and multisubphase control. 4,218,758, Cl. 364-900.000.

Allersma, Ties, to PPG Industries, Inc. Strengthened translucent glass-ceramics and method of making. 4,218,512, Cl. 428-410.000.

Allied Chemical Corporation: *See*—
Kim, Yang K., 4,218,353, Cl. 260-28.50D.

Alps Electric Co., Ltd.: *See*—
Iwasaki, Sadayoshi; and Kumagaya, Masao, 4,218,598, Cl. 200-153.00J.
Komatsu, Hiroki; and Oka, Tsumoru, 4,218,594, Cl. 200-11.00G.

Alsthom-Atlantique: *See*—
Vaudrey, Pierre, 4,217,810, Cl. 91-363.00A.

Alza Corporation: *See*—
Theeuwes, Felix, 4,217,898, Cl. 128-260.000.

Amerace Corporation: *See*—
Mayer, Robert W.; and Smorzaniuk, Adam, 4,218,593, Cl. 200-11.0TW.

American Can Company: *See*—
Rouse, John W., 4,218,004, Cl. 226-149.000.

American Cyanamid Company: *See*—
Biehl, Raymond J.; and Marlow, William H., 4,217,851, Cl. 118-20.000.
Grudzinskas, Charles V.; and Weiss, Martin J., 4,218,565, Cl. 560-121.000.
Maulding, Donald R.; and Behrens, Rudolf A., 4,218,559, Cl. 528-389.000.
Poletto, John F.; and Bernstein, Seymour, 4,218,395, Cl. 260-507.00R.
Weiss, Martin J.; and Siuta, Gerald J., 4,218,566, Cl. 560-121.000.

Amidon, Alan B.: *See*—
Pacansky, Thomas J.; and Amidon, Alan B., 4,218,514, Cl. 428-447.000.

Ancos Co., Ltd.: *See*—
Hashimoto, Yasuyuki, 4,218,153, Cl. 401-67.000.

Anderson, Arnold N.; and Crennan, Gerard. Refrigeration insulation panel and structure. 4,218,104, Cl. 312-214.000.

Anderson, Robert F., to UOP Inc. Hydrofluoric acid alkylation utilizing a unitary settler-soaker vessel. 4,218,574, Cl. 585-719.000.

Andersson, Erik T.: *See*—
Fuchs, Alfred; and Andersson, Erik T., 4,218,265, Cl. 134-18.000.

Andrews, Edwin T., to Western Electric Company, Inc. Conveying apparatus having load-bearing connecting links. 4,218,025, Cl. 242-47.130.
Angelini, Edward J., to Combustion Engineering, Inc. Flue gas reheat system. 4,217,861, Cl. 122-1.00R.
Anghinoni di Luigi, Ottorino, to Rockwell-Rimoldi S.p.A. Roller feed device for sewing machines. 4,217,842, Cl. 112-322.000.
Angus Fire Armour Limited: *See*—
Wotton, John, 4,217,961, Cl. 169-41.000.
Anic, S.p.A.: *See*—
Romano, Ugo; Tesei, Renato; Cipriani, Gioacchino; and Micucci, Lidio, 4,218,391, Cl. 260-463.000.
Anselrode, Lodewijk: *See*—
Vertegaal, Jacobus-Gerardus; and Anselrode, Lodewijk, 4,217,821, Cl. 101-181.000.
Antoci, Frank J.: *See*—
Baxter, Robert, Jr.; Antoci, Frank J.; Tynes, William J., III; Petrucci, Pasquale M.; and Martin, George F., 4,218,610, Cl. 235-92.0PC.
Anton/Bauer, Inc.: *See*—
Wilson, Anton F., 4,218,107, Cl. 339-75.00P.
Antonoplos, Patricia A.; Bertino, Clarence D.; and Heilman, William J., to Gulf Oil Corporation. Process for preparation of acetylene end-capped polyimide oligomers. 4,218,555, Cl. 528-126.000.
Antos, John M.: *See*—
Sargent, Charles L.; Hoffman, John A.; Antos, John M.; and Henke, Arthur W., 4,217,668, Cl. 4-321.000.
Aoki, Eiichiro: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,217,804, Cl. 84-1.030.
Aoyagi, Shoji: *See*—
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Aoyama, Tetsuo: *See*—
Saito, Masao; Mizuno, Kinichi; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,218,398, Cl. 260-561.00R.
Aoyama, Yuji: *See*—
Kameya, Toru; and Aoyama, Yuji, 4,218,501, Cl. 428-90.000.
Apichella, John L.: *See*—
Hilbert, Robert A.; Kohl, William F., Jr.; Whelan, Joseph M.; and Apichella, John L., 4,218,058, Cl. 273-1.50R.
Apparatebau Rothemuhle Brandt & Kritzler: *See*—
Kirchhoff, Franz J.; and Brandt, Joachim, 4,218,225, Cl. 55-112.000.
Arai, Takao, to Hitachi, Ltd. Amplifier circuit for a hall-effect head. 4,218,659, Cl. 330-6.000.
Arcair Company: *See*—
Hoffman, Stephen A.; and Hummel, Jerry R., 4,218,605, Cl. 219-70.000.
Arcamone, Federico: *See*—
Penco, Sergio; Franchi, Giuliano; and Arcamone, Federico, 4,218,440, Cl. 424-180.000.
Arends, Kenneth W., to Waycrosse, Inc. Portable, self-unloading fertilizer tender. 4,218,169, Cl. 414-523.000.
Arima, Heihachi: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, 4,218,135, Cl. 355-72.000.
Arimizu, Tsutomu: *See*—
Niimi, Tadashi; Niimi, Masanori; and Arimizu, Tsutomu, 4,218,318, Cl. 210-150.000.
Armbruster, Joseph M., to Sheller-Globe Corporation. Roof mounted motor vehicle air conditioner. 4,217,764, Cl. 62-323.000.
Armstrong, Arthur A.; Baur, Gerd R.; Carpenter, Charles N.; Folk, Edwin W.; Stookey, Donald J.; and Voges, Robert L., to Monsanto Company. Process for removing unreacted monomers from polymerization slurries. 4,218,358, Cl. 260-32.60N.
Arnold, Leonard R., to Fansteel Inc. Heavy duty cutting insert. 4,218,160, Cl. 407-114.000.
Arnold, Richard B.: *See*—
Barrett, Eugene R.; and Arnold, Richard B., 4,217,938, Cl. 140-92.100.
Arnold, Robert W.; and Galetto, Louis V., to International Business Machines Corporation. Analog DC motor velocity control loop. 4,218,641, Cl. 318-341.000.
Arnoldt, Peter J., to Ductmate Industries, Inc. Flange type duct joint assembly. 4,218,079, Cl. 285-331.000.
ARP Instruments, Inc.: *See*—
Dodds, Philip V. W., 4,217,803, Cl. 84-1.100.
Artt, David W.: *See*—
Barry, Brian; and Artt, David W., 4,218,179, Cl. 415-114.000.
Asahi Glass Company Limited: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; and Gunjima, Tomoki, 4,218,542, Cl. 521-27.000.
Asano, Kazuhiro: *See*—
Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Satoh, Katsuhiko; Mandai, Masaaki; and Shida, Masaharu, 4,217,751, Cl. 368-76.000.
Asawa, Tatsuro: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; and Gunjima, Tomoki, 4,218,542, Cl. 521-27.000.
Ashland Oil, Inc.: *See*—
Gannon, Charles R.; and Sawran, William R., 4,218,305, Cl. 208-14.000.
Norton, Richard V., 4,218,570, Cl. 585-23.000.
Assal, Tsvi F.; Berman, Arnold; and Mahle, Christoph E., to Communications Satellite Corporation. Temperature-compensated microwave integrated circuit delay line. 4,218,664, Cl. 333-156.000.
Assanti, Philip N. Variable mosaic pattern with interchangeable components. 4,217,740, Cl. 52-311.000.
Asta-Werke Aktiengesellschaft Chemische Fabrik: *See*—
Brock, Norbert; and Stekar, Jurij, 4,218,471, Cl. 424-315.000.
Astec Industries, Inc.: *See*—
Brock, James D.; and Mize, Erbie G., 4,218,145, Cl. 366-18.000.
Astra Pharmaceutical Products, Inc.: *See*—
Boyes, Robert N.; Duce, Benjamin R.; Smith, Emil R.; and Byrnes, Eugene W., 4,218,477, Cl. 424-324.000.
Atlantic Richfield Company: *See*—
Ecker, Amir L., 4,217,765, Cl. 62-503.000.
Styring, Ralph E., Jr., 4,218,304, Cl. 208-8.00R.
Atlas Powder Company: *See*—
Brockington, James W., 4,218,272, Cl. 149-21.000.
Atrepiev, Vladimir S.; Vinokur, Mark L.; and Murov, Genrikh F. Bellows sections welder. 4,218,006, Cl. 228-48.000.
Atsumi, Toshio; Tarumi, Yuzo; and Yoshida, Noboru, to Sumitomo Chemical Company, Limited. 2-Substituted 5-hydroxy-1H-imidazole-4-carboxamide derivatives and use. 4,218,457, Cl. 424-263.000.
Attenburrow, Donald P. Stethoscope for use on a horse. 4,218,584, Cl. 179-1.0ST.
Atwater, Mark V.; and Atwater, W. David, to Royal Textile Mills, Inc. Athletic brassiere. 4,217,905, Cl. 128-498.000.
Atwater, W. David: *See*—
Atwater, Mark V.; and Atwater, W. David, 4,217,905, Cl. 128-498.000.
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Avco Corporation: *See*—
King, Robert W., 4,218,276, Cl. 156-92.000.
Averill, Robert G., to Minnesota Mining and Manufacturing Company. Tibial prosthesis having a U-shaped intramedullary stem. 4,217,666, Cl. 3-1.911.
Avery International Inc.: *See*—
Korzeniewski, Eugene C., 4,218,030, Cl. 242-67.200.
Avicon Development Group: *See*—
Pratt, Wayne L.; and King, Paul E., 4,218,744, Cl. 364-442.000.
Babaud, Jean; and Goodwin, R. Wendell, to Sangamo Weston, Inc. Apparatus and method for digital noise synthesis. 4,218,749, Cl. 364-717.000.
Babcock & Wilcox Company, The: *See*—
Freund, Melvin A., 4,218,016, Cl. 239-186.000.
Thayer, John R., 4,217,778, Cl. 73-293.000.
Bacardit, Juan S., to Bendix Corporation, The. Hydraulic rotary distributor, particularly for use in power steering mechanisms. 4,217,932, Cl. 137-625.210.
Bach, Lloyd G.; Brown, Arthur K., Jr.; and Tam, George M., to Bendix Corporation, The. Hydraulic brake booster with integral accumulator. 4,217,758, Cl. 60-404.000.
Bacha, John D.; and Hill, Robert W., to Gulf Research & Development Company. Extreme pressure lubricating compositions. 4,218,331, Cl. 252-48.600.
Bacskai, Robert, to Chevron Research Company. Pyrrolidone polymerization catalyst system. 4,218,558, Cl. 528-315.000.
Bacskay, Stephen A. Hamper. 4,218,103, Cl. 312-211.000.
Badger Meter, Inc.: *See*—
Pelt, Thomas E., 4,217,929, Cl. 137-527.800.
Bahder, George; and Thompson, Paul F., to General Cable Corporation. Telephone service wire with ester-based filling compound. 4,218,577, Cl. 174-23.00C.
Baikie, Hugh E., to Tuuk Sports Ltd. Ice skate and method of manufacture therefor. 4,218,069, Cl. 280-11.120.
Bailey, Raymond A.: *See*—
Vanecek, Michael J.; Piepenhagen, John H. K.; Neale, Michael J.; Lasiter, Steven M.; and Bailey, Raymond A., 4,218,048, Cl. 266-236.000.
Bajpai, Praphulla K.; and Graves, George A., to University of Dayton. Porous ceramic carriers for controlled release of proteins, polypeptide hormones, and other substances within human and/or other mamillian species and method. 4,218,255, Cl. 106-45.000.
Baker, J. W.: *See*—
Goldberg, David B.; and Baker, J. W., 4,217,663, Cl. 2-102.000.
Balchem Corporation: *See*—
Warren, Charlotte L., 4,218,262, Cl. 106-206.000.
Balcke-Durr Aktiengesellschaft: *See*—
Henning, Herbert; and Kliemann, Siegfried, 4,218,408, Cl. 261-112.000.
Bald, Hubert; and Zeitel, Joachim, to Maschinenfabrik Alfred Schmermund GmbH & Co. Production of blocks of rod-shaped articles. 4,217,979, Cl. 198-419.000.
Baldwin, Jack W.; and Carlson, Jonathon D., to General Motors Corporation. Air shroud device for paint spray guns. 4,218,019, Cl. 239-290.000.
Ballard, Thomas B. Cleaning machine with externally mounted turntable trolley operator. 4,217,920, Cl. 134-141.000.
Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten: *See*—
Kraus, Thaddaus, 4,217,856, Cl. 118-724.000.
Barat, Benedict W., to Singer Company, The. Adjustable anti-spill bobbin tension spring. 4,217,839, Cl. 112-229.000.
Barbier, Jean-Claude: *See*—
Huin, Roland; and Barbier, Jean-Claude, 4,218,338, Cl. 252-415.000.

Barclay Home Products, Inc.: *See*—
Buchman, Alex, 4,217,662, Cl. 2-69.500.
Barkow, William H.; and Shisler, Robert W., to RCA Corporation. Convergence adjustment arrangement using magnetic tabs with differential motion. 4,218,667, Cl. 335-212.000.
Barnish, Ian T.; Cross, Peter E.; and Danilewicz, John C., to Pfizer Inc. Derivatives of L- and DL-4-hydroxyphenylglycine. 4,218,474, Cl. 424-319.000.
Barrett, Eugene R.; and Arnold, Richard B., to General Electric Company. Apparatus and method for making dynamoelectric machine windings. 4,217,938, Cl. 140-92.100.
Barrett, George M. Internal combustion engine. 4,217,865, Cl. 123-47.00A.
Barrowman, Thomas: *See*—
Abu-Akeel, Abdulhadi K.; Barrowman, Thomas; and Rieck, Gerald C., 4,218,166, Cl. 414-1.000.
Barry, Brian; and Artt, David W., to Rolls-Royce Limited. Isothermal aerofoil with insulated internal passageway. 4,218,179, Cl. 415-114.000.
Bart, Theodor E.; and Mills, Ronald A., to RCA Corporation. TV Graphics and mixing control. 4,218,698, Cl. 358-22.000.
Bartel, Siegfried: *See*—
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.
Barth, Ludwig. Current collector for amusement park bumper cars. 4,217,975, Cl. 191-13.000.
Bartha, Bela: *See*—
Nadasy, Miklos; Kovacs, Miklos; Kolcsei, Marton; Vad, Janos; Bartha, Bela; Dobozy, Otto; Mate, Ferenc; and Karacsonyi nee Spindler, Eva, 4,218,234, Cl. 71-86.000.
Bartolini, Robert A.: *See*—
Bloom, Allen; and Bartolini, Robert A., 4,218,689, Cl. 346-135.100.
BASF Aktiengesellschaft: *See*—
Daubach, Ewald; Herrmann, Manfred; Oppenlaender, Knut; and Stork, Karl, 4,218,218, Cl. 8-550.000.
Fleig, Helmut; Hagen, Helmut; Dockner, Toni; and Kohlmann, Friedrich W., 4,218,460, Cl. 424-270.000.
Hahn, Klaus; Walter, Manfred; Stange, Karl; and Weber, Heinz, 4,218,511, Cl. 428-407.000.
Hohenschutz, Heinz; Schmidt, Johannes E.; and Kiefer, Hans, 4,218,568, Cl. 562-609.000.
Kroner, Michael, 4,218,393, Cl. 260-465.600.
BASF Wyandotte Corporation: *See*—
Kappler, Frank R.; Cramer, John J.; and Kakar, Sarwan K., 4,218,220, Cl. 8-102.000.
Bath, Nigel A.: *See*—
Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; and Wheldon, Alfred G., 4,218,491, Cl. 426-600.000.
Bathum, Roy N., Jr.; and Mallow, Jerry L., to Beebe Bros., Inc. Safety overload indicating winch lever resettable lockout means. 4,218,046, Cl. 254-266.000.
Batova, Margarita I.; Meschaninov, Igor V.; Khajutin, Sergei G.; Shapiro, Sergei L.; and Shpichinetsky, Efim S. Nickel-base alloy. 4,218,245, Cl. 75-170.000.
Bauer, Fritz G. Equipment in film cameras. 4,218,116, Cl. 352-22.000.
Bauer, Kurt: *See*—
Fiege, Helmut; Wedemeyer, Karlfried; Bauer, Kurt; and olleken, Reiner, 4,218,380, Cl. 260-340.50R.
Bauer, Walter; Krobel, Heinz; and Muller, Jurgen, to AGFA-Gevaert, A.G. Apparatus for feeding sheets to ionography imaging chambers. 4,218,054, Cl. 271-11.000.
Bauer, Walter: *See*—
Krobel, Heinz; and Bauer, Walter, 4,218,055, Cl. 271-106.000.
Baum, James P.: *See*—
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Baur, Gerd R.: *See*—
Armstrong, Arthur A.; Baur, Gerd R.; Carpenter, Charles N.; Folk, Edwin W.; Stookey, Donald J.; and Voges, Robert L., 4,218,358, Cl. 260-32.60N.
Baxter, Larry K.; and Brickman, A. Donald, to Echolabs, Inc. Video switching system. 4,218,709, Cl. 358-181.000.
Baxter, Robert, Jr.; Antoci, Frank J.; Tynes, William J., III; Petrucci, Pasquale M.; and Martin, George F., to J. T. Baker Chemical Co. Automatic blood analyzing system. 4,218,610, Cl. 235-92.0PC.
Baxter Travenol Laboratories, Inc.: *See*—
Gokcen, Cem M., 4,218,416, Cl. 264-167.000.
Jess, Thurman S.; and Shim, Norm, 4,217,993, Cl. 222-14.000.
Bayer Aktiengesellschaft: *See*—
Feyen, Peter; Konig, Hans-Bodo; and Metzger, Karl G., 4,218,451, Cl. 424-250.000.
Fiege, Helmut; Wedemeyer, Karlfried; Bauer, Kurt; and olleken, Reiner, 4,218,380, Cl. 260-340.50R.
Fuchs, Rainer; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,218,469, Cl. 424-304.000.
Maas, Joachim; Mundil, Rudolf; Degen, Bruno; and Moretto, Hans-Heinrich, 4,218,387, Cl. 556-412.000.
Serini, Volker; Beck, Manfred; Morbitzer, Leo; Humme, Gert; and Schnetger, Jochen, 4,218,545, Cl. 525-92.000.
Weber, Christian; and Schafer, Hermann, 4,218,543, Cl. 521-51.000.
Wolfrum, Gerhard; Klauke, Erich; and Otten, Hans-Gunter, 4,218,373, Cl. 260-198.000.
Bayman, Jack A.; and Green, Robert G., to International Telephone and Telegraph Corporation. Wheel cover having snap-on retention means. 4,218,099, Cl. 301-37.00R.
BBC Brown, Boveri & Company, Limited: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., 4,218,281, Cl. 156-281.000.
Beasley, Max M.; Defore, Leroy A.; and King, Hugh C., to Tuftco Corporation. Fine gauge looper apparatus for in-line tufting machine. 4,217,837, Cl. 112-79.00R.
Beck, Manfred: *See*—
Serini, Volker; Beck, Manfred; Morbitzer, Leo; Humme, Gert; and Schnetger, Jochen, 4,218,545, Cl. 525-92.000.
Becker, Rolf. Frameless support for pictures. 4,217,710, Cl. 40-156.000.
Beckman Instruments, Inc.: *See*—
Lindell, Grover F.; and Matsuyama, George, 4,218,299, Cl. 204-195.00F.
Meyer, Richard C.; and Buzza, Edmund E., 4,218,197, Cl. 417-442.000.
Ray, Robert A., 4,218,535, Cl. 435-12.000.
Beckwith, Robert W.; and Wyatt, Michael A. Synchronizing check relay. 4,218,625, Cl. 307-87.000.
Bedard, James F.; and Hughes, William C., to General Electric Company. Electron gun with stationary beam during blanking. 4,218,635, Cl. 315-17.000.
Beebe Bros., Inc.: *See*—
Bathum, Roy N., Jr.; and Mallow, Jerry L., 4,218,046, Cl. 254-266.000.
Behnke, Robert C. Syringe plunger snap-on pull ring. 4,217,896, Cl. 128-218.0PA.
Behrens, Rudolf A.: *See*—
Maulding, Donald R.; and Behrens, Rudolf A., 4,218,559, Cl. 528-389.000.
Behrenz, Wolfgang: *See*—
Fuchs, Rainer; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,218,469, Cl. 424-304.000.
Bell & Howell Company: *See*—
Parker, Robert R., 4,218,115, Cl. 352-7.000.
Bell Telephone Laboratories, Incorporated: *See*—
Dunkleberger, LaRue N., 4,218,532, Cl. 430-314.000.
Emo, George C., 4,218,653, Cl. 324-421.000.
Fraser, Alexander G., 4,218,756, Cl. 364-900.000.
Kutzavitch, Walter G., 4,218,649, Cl. 324-54.000.
Netravali, Arun N.; and Robbins, John D., 4,218,703, Cl. 358-136.000.
Netravali, Arun N.; and Robbins, John D., 4,218,704, Cl. 358-136.000.
Seidel, Harold, 4,218,776, Cl. 455-619.000.
Weller, David R., 4,218,770, Cl. 375-118.000.
Belmondo, Armando; and Castagna, Massimo, to Centro Richerche Fiat S.p.A. Process for coating a metallic surface with a wear-resistant material. 4,218,494, Cl. 427-35.000.
Belokin, Paul, Jr. Bifurcated resilient pin-engaging electrical connector and method for making same. 4,218,106, Cl. 339-32.00R.
Beltrami, Pier-Angelo; and Halmdienst, Franz. Folding chair. 4,218,089, Cl. 297-58.000.
Beltran, Adrian M.: *See*—
Schilling, William F.; and Beltran, Adrian M., 4,218,007, Cl. 228-194.000.
Bendig, Larry L.: *See*—
Stowell, Donald E.; Scamehorn, John F.; and Bendig, Larry L., 4,218,413, Cl. 264-13.000.
Bendix Corporation, The: *See*—
Bacardit, Juan S., 4,217,932, Cl. 137-625.210.
Bach, Lloyd G.; Brown, Arthur K., Jr.; and Tam, George M., 4,217,758, Cl. 60-404.000.
Holcomb, Orla L., Jr., 4,217,974, Cl. 188-77.00R.
Benjamen, Lysle I.: *See*—
Ellis, Henry D.; and Benjamen, Lysle I., 4,218,547, Cl. 525-148.000.
Bennett, Paul W. Mathematical function graphic display. 4,217,702, Cl. 35-30.000.
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mensch, William D., Jr.; Peddle, Charles I.; Schriber, Gene A.; and Wiles, Michael F., to Motorola, Inc. Interface adaptor architecture. 4,218,740, Cl. 364-200.000.
Berezin, Gilbert H.: *See*—
Aldrich, Paul E.; and Berezin, Gilbert H., 4,218,448, Cl. 424-244.000.
Berger, Sidney E.: *See*—
Burhans, Allison S.; and Berger, Sidney E., 4,218,360, Cl. 260-37.0EP.
Bergstrom, Sven: *See*—
Hagg, Per B.; Bergstrom, Sven; Lundmark, Lars E.; and Hedberg, Carl-Erik L., 4,218,414, Cl. 264-40.400.
Berkowitz, Donald A.: *See*—
DeGraw, Joseph I.; Lawson, John A.; Johnson, Howard L.; Loew, Gilda H.; and Berkowitz, Donald A., 4,218,454, Cl. 424-260.000.
Berman, Arnold: *See*—
Assal, Tsvi F.; Berman, Arnold; and Mahle, Christoph E., 4,218,664, Cl. 333-156.000.
Bernat, Georg, to ITT Industries, Inc. Low noise slide valve. 4,218,041, Cl. 251-127.000.
Bernstein, Seymour: *See*—
Poletto, John F.; and Bernstein, Seymour, 4,218,395, Cl. 260-507.00R.
Bertino, Clarence D.: *See*—
Antonoplos, Patricia A.; Bertino, Clarence D.; and Heilman, William J., 4,218,555, Cl. 528-126.000.
Bethlehem Steel Corporation: *See*—
Clymer, John C.; and Eberhardt, Nikoli, 4,218,712, Cl. 358-229.000.

Beu, Richard A., to Teledyne Hanau Division of Teledyne, Inc. Three-section self-sealing dental flask. 4,218,205, Cl. 425-180.000.

Bex, Jean Pierre; and Mantel, Claude, to Societe d'Utilisation Scientifique et Industrielle du Froid - Usifroid. Prosthesis for use in valvuloplasty. 4,217,665, Cl. 3-1.500.

Biedermann, Ernst, to AGFA-Gevaert, A.G. Photographic copying apparatus. 4,218,133, Cl. 355-56.000.

Biedermann, Ernst: *See*—
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.

Biehl, Raymond J.; and Marlow, William H., to American Cyanamid Company. Tablet coating apparatus. 4,217,851, Cl. 118-20.000.

Bieler, Anne C.; and Howe, Milton A., to W. R. Grace & Co. Process for packaging, cooling and storing food items. 4,218,486, Cl. 426-412.000.

Biggerstaff, George E., to Nuclear Fuel Services, Inc. Process for the production of porous metal oxide microspheres and microspheres produced by said process. 4,218,430, Cl. 423-632.000.

Biggs, William W.: *See*—
Johnston, Jerome E.; Middendorf, Lyle R.; and Biggs, William W., 4,218,140, Cl. 356-226.000.

Biscaro, Elia, to Botanik S.r.l. Manufacture of foam coated rod-like elements particularly for supporting pot-grown plants in general. 4,218,415, Cl. 264-46.400.

Blanchaud, Maurice; and Bournier, Edgar. Process for treatment of mushrooms. 4,218,484, Cl. 426-262.000.

Blazewicz, Andrzej: *See*—
Jaromin, Zygmunt; Szymczyk, Boleslaw; Blazewicz, Andrzej; and Pilarski, Klemens, 4,218,095, Cl. 299-87.000.

Bletz, Walter, to Ernst Leitz Wetzlar GmbH. Amplifier for electric signals. 4,218,613, Cl. 250-214.00A.

Blonder, Isaac S., to Blonder-Tongue Laboratories, Inc. Yagi-type antennas and method. 4,218,686, Cl. 343-819.000.

Blonder-Tongue Laboratories, Inc.: *See*—
Blonder, Isaac S., 4,218,686, Cl. 343-819.000.

Bloom, Allen; and Bartolini, Robert A., to RCA Corporation. Ablatable medium for optical recording. 4,218,689, Cl. 346-135.100.

Bodenseewerk Geratetechnik GmbH: *See*—
Schmidt-Roedenbeck, Heiner; Wust, Peter; and Wellern, Wilfried, 4,217,754, Cl. 60-39.28R.

Boehm, Ernst; and Eder, Heinz, to Gebr. Eicher G.m.b.H. Straw chopper and spreader attachment for a combine harvester. 4,218,022, Cl. 241-101.700.

Boehringer Mannheim GmbH: *See*—
Eisenbach, Dieter; and Gosewinkel, Werner, 4,218,336, Cl. 252-411.00R.

Boeing Commercial Airplane Company: *See*—
Laskody, Jerome R., 4,217,756, Cl. 60-262.000.

Bofors America, Inc.: *See*—
Spoor, Martin, 4,217,785, Cl. 73-766.000.

Bohm, Manfred; and Peuker, Gunther, to International Standard Electric Corporation. Airborne or ground station for a radio navigation system and particularly a DME system. 4,218,679, Cl. 343-6.50R.

Boise Cascade Corporation: *See*—
Roder, Hugh H.; and Baum, James P., 4,217,693, Cl. 30-292.000.

Bolliger, Martin: *See*—
Gyongyos, Ivan; and Bolliger, Martin, 4,217,947, Cl. 164-87.000.

Bombelli, Nino: *See*—
Egli, Ernst; Bombelli, Nino; and Misteli, Max, 4,218,050, Cl. 266-281.000.

Bondinell, William E.; and Pendleton, Robert G., to SmithKline Corporation. 4- and 5-Substituted 2,3-dihydro-1H-isoindoles, pharmaceutical compositions and method of inhibiting phenylethanolamine N-methyltransferase. 4,218,464, Cl. 424-274.000.

Boozer, John D., to Link Built Products of Ocala, Inc. Vacuum apparatus. 4,218,226, Cl. 55-274.000.

Borger, Robert M.: *See*—
Wilson, Stanley, Jr.; and Borger, Robert M., 4,218,677, Cl. 340-506.000.

Borovinskaya, Inna P.: *See*—
Merzhanov, Alexandr G.; Kachin, Alexandr R.; Jukhvid, Vladimir I.; Borovinskaya, Inna P.; and Vishnyakova, Galina A., 4,217,948, Cl. 164-115.000.

Borsig GmbH: *See*—
Eiermann, Dankwart, 4,218,199, Cl. 418-54.000.

Borvendeg, Janos: *See*—
Solyom, Sandor; Toldy, Lajos; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,218,446, Cl. 424-241.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Hammele, Karl; and Schotten, Henno, 4,217,763, Cl. 62-227.000.

Bose Corporation: *See*—
Poulo, Louis R., 4,218,583, Cl. 179-1.00E.

Bostian, Logan C.; and Winslow, Charles E., Jr., to Virginia Chemicals Inc. Production of alkali metal dithionites from sulfur dioxide, alkali metal formates, and slurried bisulfite compounds at high reactant concentrations. 4,218,429, Cl. 423-515.000.

Botanik S.r.l.: *See*—
Biscaro, Elia, 4,218,415, Cl. 264-46.400.

Bottka, Nicholas, to United States of America, Navy. Lattice matching measurement device. 4,218,143, Cl. 356-445.000.

Boucherie, Leonel P., to G. B. Boucherie, naamloze rennootschap, Firma. Device for handling brush bodies made of flexible material. 4,218,096, Cl. 300-3.000.

Bourke, Robert F.; and Johansen, David K., to Gould Inc. Time controlled battery charger. 4,218,644, Cl. 320-21.000.

Bournier, Edgar: *See*—
Blanchaud, Maurice; and Bournier, Edgar, 4,218,484, Cl. 426-262.000.

Bowles, Vernon O., to Solartrap, Inc. Solar heat collection. 4,217,885, Cl. 126-444.000.

Bowling, James A., to Philip Morris Incorporated. Apparatus and method for checking score lines in flat package blanks. 4,217,694, Cl. 33-125.00A.

Boydelatour, Lester: *See*—
Olinger, Kenneth J.; and Boydelatour, Lester, 4,218,097, Cl. 301-5.00B.

Boyes, Robert N.; Duce, Benjamin R.; Smith, Emil R.; and Byrnes, Eugene W., to Astra Pharmaceutical Products, Inc. Primary aminoacylanilides, methods of making the same and use as antiarrhythmic drugs. 4,218,477, Cl. 424-324.000.

Bozon, Alfred: *See*—
Lakatos, Eduard; Koberstein, Edgar; Hensel, Jorg; and Bozon, Alfred, 4,218,341, Cl. 252-430.000.

Brack, Karl, to Design Cote Corp. Radiation curable coating composition. 4,218,294, Cl. 204-159.130.

Bradley, Arthur W., to General Motors Corporation. Power steering gear with delashed piston nut and screw threading. 4,217,813, Cl. 91-375.00A.

Bradstreet, James A.; and Roller, Judith E., to Personal Products Company. Crush-resistant adhesively-attached absorbent product. 4,217,901, Cl. 128-290.00R.

Brailsford, Lawrence J.: *See*—
Kelley, Ishmael C.; and Brailsford, Lawrence J., 4,218,763, Cl. 340-65.000.

Brakebill, Harold G., to Robertshaw Controls Company. Valve positioner and method of making same. 4,218,040, Cl. 251-28.000.

Brandt, Joachim: *See*—
Kirchhoff, Franz J.; and Brandt, Joachim, 4,218,225, Cl. 55-112.000.

Braun Engineering Company: *See*—
Braun, Frederick W., 4,217,771, Cl. 72-358.000.

Braun, Frederick W., to Braun Engineering Company. Method of cold forming. 4,217,771, Cl. 72-358.000.

Breiter, Manfred W.: *See*—
Dunn, Bruce S.; Breiter, Manfred W.; and King, Randall N., 4,218,524, Cl. 429-104.000.

Breithaupt, David W., to RCA Corporation. Push-pull amplifier. 4,218,638, Cl. 315-397.000.

Bremer, Noel J.: *See*—
Milberger, Ernest C.; Dolhyj, Serge R.; and Bremer, Noel J., 4,218,382, Cl. 260-346.750.

Brent, Charles R. Concentrating solar collector with mechanical tracking apparatus. 4,217,881, Cl. 126-425.000.

Brewing Research Foundation, The: *See*—
Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; and Wheldon, Alfred G., 4,218,491, Cl. 426-600.000.

Brickman, A. Donald: *See*—
Baxter, Larry K.; and Brickman, A. Donald, 4,218,709, Cl. 358-181.000.

Bridgestone Tire Company Limited: *See*—
Takigawa, Hiroyoshi; and Tezuka, Toshiro, 4,217,942, Cl. 152-209.00R.
Tsuzura, Junichi, 4,217,943, Cl. 152-209.00B.

Briggs, Aubrey C., to Dravo Corporation. Conveying apparatus. 4,217,981, Cl. 198-839.000.

Brigman, Ronald D.: *See*—
Cooper, Gary D.; and Brigman, Ronald D., 4,218,063, Cl. 273-237.000.

Brill, Joseph H. Hydro-therapy device. 4,217,892, Cl. 128-66.000.

Brinegar, Bill W.; and Haines, John W., to Rockwell International Corporation. Video clamp. 4,218,706, Cl. 358-172.000.

Brisken, Axel F.; and Smith, Lowell S., to General Electric Company. Fabrication of front surface matched ultrasonic transducer array. 4,217,684, Cl. 29-25.350.

British Industrial Plastics Limited: *See*—
Downing, Brian Y.; and Hamer, George D., 4,218,546, Cl. 525-170.000.

Brocard, Francois; Denizot, Andre; and Dif, Marcel, to Societe Nationale Industrielle. Means for remote control of an aircraft video system for surveying ground activity. 4,218,702, Cl. 358-109.000.

Brock, James D.; and Mize, Erbie G., to Astec Industries, Inc. Liquid asphalt weigh out system. 4,218,145, Cl. 366-18.000.

Brock, Norbert; and Stekar, Jurij, to Asta-Werke Aktiengesellschaft Chemische Fabrik. Process for the treatment of humans suffering from undesired urotoxic side effects caused by cytostatically active alkylating agents. 4,218,471, Cl. 424-315.000.

Brockington, James W., to Atlas Powder Company. Water-in-oil NCN emulsion blasting agent. 4,218,272, Cl. 149-21.000.

Brockway Glass Company, Inc.: *See*—
Hogan, Patrick M., 4,218,230, Cl. 65-30.00E.

Brooks, Alden W.: *See*—
Hollaway, Gerald C., Jr.; and Brooks, Alden W., 4,217,680, Cl. 19-0.460.

Brooks, Clyde, Jr. Method of propelling a game playing piece. 4,218,062, Cl. 273-108.000.

Brosow, Jorgen; and Furugard, Erik, to Dasy Inter S.A. Method and a system for verifying authenticity safe against forgery. 4,218,674, Cl. 340-149.00A.

Brouard, Claude M. H. E.; and Moerel, Claude L. E., to Produits Chimiques Ugine Kuhlmann. Reactive complex chromium-bearing azo dyestuffs. 4,218,367, Cl. 260-146.00R.

Brouard, Claude M. H. E.; Moerel, Claude L. E.; and Stiot, Jean-Pierre H., to Produits Chimiques Ugine Kuhlmann. Cycloammonium-azophenyl-dyestuffs containing one cyanoethyl, carbamoylethyl or carbalkoxyethyl group on the phenyl radical. 4,218,369, Cl. 260-157.000.

Brown, Arthur K., Jr.: *See*—
Bach, Lloyd G.; Brown, Arthur K., Jr.; and Tam, George M., 4,217,758, Cl. 60-404.000.

Brown, Claud E. Paint guard device. 4,217,854, Cl. 118-504.000.

Brown, Donald M. Inventory restraining device for merchandise display hook. 4,217,986, Cl. 211-57.100.

Brown, Larry L.; and Hamm, Robert G. Mine roof warning indicator. 4,217,849, Cl. 116-212.000.

Brown, Otice E.: *See*—
Joosten, Wesley L.; Mart, Carl F.; Miller, John W.; and Brown, Otice E., 4,218,767, Cl. 367-79.000.

Brown, Thomas, to Perfection Manufacturing Company, The. Lawn mower grass catcher assembly. 4,217,747, Cl. 56-203.000.

Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Substituted 4-pyrimidone compounds, compositions and methods of use. 4,218,452, Cl. 424-251.000.

Bruckner, Carl H., to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Assembly for clamping and tightening a blanket over a blanket cylinder in a printing press. 4,217,825, Cl. 101-415.100.

Brundiek, Horst, to Loesche GmbH. Grinding pan bearing arrangement and drive of a roller mill. 4,218,023, Cl. 241-121.000.

Brundle, Leonard K.; Longley, Stuart R.; and Coleman, Michael D., to U.S. Philips Corporation. Waveguide power limiter. 4,218,663, Cl. 333-17.00L.

Brusilovsky, Mikhail G.; Krasnokutsky, Valentin P.; Nemtinova, Galina I.; Novozhilov, Evgeny N.; Pekarsky, Viktor A.; Platonova, Svetlana A.; and Tumansky, Alexandr S. Method for preparing biuret-structure polyisocyanates. 4,218,390, Cl. 260-453.0AB.

Bryan, William G., Jr. Side protector for vehicles. 4,217,715, Cl. 40-591.000.

Bubeck, Friedrich: *See*—
Floymayr, Joachim; Jericho, Karl; Drechsel, Dietrich; and Bubeck, Friedrich, 4,218,424, Cl. 422-249.000.

Buchman, Alex, to Barclay Home Products, Inc. Comforter and robe combination. 4,217,662, Cl. 2-69.500.

Buissiere, Jean, to Institut Pasteur. Medium for the cultivation of microorganisms. 4,218,537, Cl. 435-34.000.

Bunch, Jesse C. Heliostat apparatus. 4,218,114, Cl. 350-292.000.

Bundy, Gordon L., to Upjohn Company, The. 11a-Methano-TXA compounds. 4,218,378, Cl. 260-333.000.

Burger, Rainer, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.). Drive arrangement for a changeable satellite printing mechanism. 4,217,823, Cl. 101-248.000.

Burhans, Allison S.; and Berger, Sidney E., to Union Carbide Corporation. Epoxy resins filled with dual-silane treated hydrated alumina. 4,218,360, Cl. 260-37.0EP.

Burr-Brown Research Corp.: *See*—
Olschewski, Wilfred W.; and Stitt, Robert M., 4,218,578, Cl. 174-35.00R.

Burr, John K.; and Wolf, William, to Motion Systems Corporation. Gear reducer. 4,217,788, Cl. 74-425.000.

Burroughs Corporation: *See*—
Drogichen, Daniel P., 4,218,757, Cl. 364-900.000.
Haas, Frank J., 4,218,647, Cl. 323-9.000.

Burton, Elwin E. Skate wheel assembly. 4,218,098, Cl. 301-5.700.

Burzin, Klaus: *See*—
Jadamus, Hans; Mumcu, Salih; Burzin, Klaus; Feldmann, Rainer; and Feinauer, Roland, 4,218,549, Cl. 525-420.000.

Buscher, David J.; Ellingwood, Robert G.; and Ressler, Marc A., to United States of America, Army. Revenue metering system for power companies. 4,218,737, Cl. 364-493.000.

Butera, Ned: *See*—
Lee, Jean; Shaw, Janice R.; Giuliano, Carmine; and Butera, Ned, 4,218,485, Cl. 426-296.000.

Buzhinsky, Vladimir L.: *See*—
Ikhsanov, Deviz F.; Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; and Galjuk, Vasily K., 4,218,044, Cl. 254-93.00R.

Buzza, Edmund E.: *See*—
Meyer, Richard C.; and Buzza, Edmund E., 4,218,197, Cl. 417-442.000.

Byrne, James P., to General Motors Corporation. Integral power steering gear with valve reaction device. 4,217,812, Cl. 91-375.00A.

Byrnes, Eugene W.: *See*—
Boyes, Robert N.; Duce, Benjamin R.; Smith, Emil R.; and Byrnes, Eugene W., 4,218,477, Cl. 424-324.000.

Byrum, Bernard W., Jr.: *See*—
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,218,632, Cl. 313-218.000.

C. H. Dexter Limited: *See*—
Jones, Newlyn; and Stewart, Alistair C., 4,218,286, Cl. 162-164.00R.

C. Reichert Optische Werke, AG: *See*—
Ruker, Otto, 4,218,112, Cl. 350-8.000.

Cagle, George C., to Rockwell International Corporation. Means for subdividing a baud period into multiple integration intervals to enhance digital message detection. 4,218,769, Cl. 375-95.000.

Callender, Maurice E.; and Jeffers, Thomas K., to Eli Lilly and Company. Anticoccidial combinations comprising nicarbazin and the polyether antibiotics. 4,218,438, Cl. 424-115.000.

Cama, Lovji D.; Christensen, Burton G.; and Guthikonda, Ravindra N., to Merck & Co., Inc. 6-Amido-1-carba-2-penem-3-carboxylic acid. 4,218,459, Cl. 424-270.000.

Camerik, Eduard: *See*—
van der Hoek, Willem; and Camerik, Eduard, 4,218,065, Cl. 274-9.00R.

Camier, Christian; and Manier, Francis, to Honeywell Inc. Chart box for the strip chart of graphical recorders. 4,218,031, Cl. 242-67.30R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Reed, Lloyd D.; Howat, M. Ross; and Ulrichsen, John E., 4,218,707, Cl. 358-113.000.

Canadian Fram Ltd.: *See*—
DeJong, Allen W., 4,217,976, Cl. 192-84.00T.

Canadian Patents & Development: *See*—
Hamza, Hassan A.; and Visman, Jan, 4,218,012, Cl. 239-10.000.

Cannon, Thomas G., to Trendmark Corporation. Method and apparatus for controlling eating behavior. 4,218,611, Cl. 235-92.00T.

Canon, Inc.: *See*—
Schickedanz, Willi, 4,218,119, Cl. 354-23.00D.

Canon Kabushiki Kaisha: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,218,131, Cl. 355-15.000.
Kamiya, Osamu; and Sekimura, Nobuyuki, 4,218,134, Cl. 355-71.000.
Motoyoshi, Junichi, 4,218,522, Cl. 429-97.000.
Shinohara, Yukimasa; and Ichihashi, Hiroo, 4,218,499, Cl. 427-444.000.
Tanaka, Hiroshi; and Saito, Takashi, 4,218,246, Cl. 430-126.000.

Canty, Michael P.; Caudy, Don W.; Hackman, Donald J.; Harris, Jeremy M.; Mowery, Robert W.; Riley, George R.; and Trott, Beverly D., to United States of America, Navy. Automatic weapon simulator. 4,217,717, Cl. 42-1.00R.

Caplan Energy Recovery Systems Limited: *See*—
Caplan, Stanley Z., 4,218,211, Cl. 432-219.000.

Caplan, Stanley Z., to Caplan Energy Recovery Systems Limited. Energy recovery system. 4,218,211, Cl. 432-219.000.

Carborundum Company, The: *See*—
McMurtry, Carl H.; Naum, Robert G.; and Forsyth, Paul F., 4,218,622, Cl. 250-518.000.

Cardinal, Rene E., to RCA Corporation. Method for resistance welding of an electro-optic device housing. 4,217,683, Cl. 29-25.130.

Carlow, Earl F.: *See*—
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mensch, William D., Jr.; Peddle, Charles I.; Schriber, Gene A.; and Wiles, Michael F., 4,218,740, Cl. 364-200.000.

Carlson, Jonathon D.: *See*—
Baldwin, Jack W.; and Carlson, Jonathon D., 4,218,019, Cl. 239-290.000.

Carlson, Robert C., to Minnesota Mining and Manufacturing Company. Addition of ethylenically unsaturated materials to control odor in photopolymerizable epoxy compositions. 4,218,531, Cl. 430-280.000.

Carlsson, Nils Gustav: *See*—
Noren, Arne I., 4,218,052, Cl. 270-71.000.

Carlton, James E.; and Schaeuble, Werner J., to International Business Machines Corporation. System for controlling a serial data channel with a microprocessor. 4,218,742, Cl. 364-200.000.

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Carpenter, Charles N.: *See*—
Armstrong, Arthur A.; Baur, Gerd R.; Carpenter, Charles N.; Folk, Edwin W.; Stookey, Donald J.; and Voges, Robert L., 4,218,358, Cl. 260-32.60N.

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Eckley, Kenneth E., 4,217,767, Cl. 64-32.00R.

Carson, Robert W. Novel arthroscope. 4,217,891, Cl. 128-6.000.

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Nagl, Gert; Ribka, Joachim; Dickmanns, Heinz; and Gotsmann, Ulrich, 4,218,219, Cl. 8-652.000.

Castagna, Massimo: *See*—
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Catalano, Vitale. Ketchup rapping apparatus. 4,217,941, Cl. 141-372.000.
Catena, Americo R.: *See—*
Robin, Allen M.; and Catena, Americo R., 4,218,423, Cl. 422-207.000.
Caterpillar Mitsubishi Ltd.: *See—*
Morita, Izuru, 4,217,927, Cl. 137-493.300.
Caterpillar Tractor Co.: *See—*
Dezelan, Joseph E., 4,217,968, Cl. 180-133.000.
Freese, Gary P.; and Olthoff, James A., 4,217,963, Cl. 172-804.000.
Leighty, Conard E., 4,218,105, Cl. 312-291.000.
Lindblom, Victor E., 4,217,790, Cl. 74-470.000.
Lutz, Karl T.; and Shepard, John L., 4,218,068, Cl. 279-1.00L.
Suckow, David S., 4,217,766, Cl. 64-1.00V.
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Kutik, Louis F.; and Cecil, Howard E., 4,218,198, Cl. 417-566.000.
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Jaromin, Zygmunt; Szymczyk, Boleslaw; Blazewicz, Andrzej; and Pilarski, Klemens, 4,218,095, Cl. 299-87.000.
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Godfroid, Jean-Jacques; and Steiner, Efroim, 4,218,473, Cl. 424-317.000.
Centro Richerche Fiat S.p.A.: *See—*
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Stringham, Leroy O.; and Lawrence, Michael J., 4,218,497, Cl. 427-289.000.
Chang, Wen-Hsuan; Peffer, John R.; and Lewarchik, Ronald J., to PPG Industries, Inc. Low organic solvent-containing polyester coating compositions. 4,218,355, Cl. 260-29.40R.
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Chapman, Bruce H.; Oliver, James E.; and Talarico, Lawrence L. Hair length measuring apparatus. 4,217,695, Cl. 33-134.00R.
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Charlton, Thomas L.; and Redden, Robert F., to Cominco Ltd. Process for extracting arsenic from oxidic materials. 4,218,425, Cl. 423-87.000.
Chase, John D.; Galvez, Buenaventura B.; and Kennedy, Bruce W., to Gulf Canada Limited. Method for processing etherified light hydrocarbon mixtures to remove methanol. 4,218,569, Cl. 568-697.000.
Chavonoz SA: *See—*
Seguin, Pierre, 4,218,202, Cl. 425-110.000.
Chemap AG: *See—*
Muller, Hans, 4,217,700, Cl. 34-19.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Frese, Albert, 4,218,551, Cl. 526-158.000.
Jadamus, Hans; Mumcu, Salih; Burzin, Klaus; Feldmann, Rainer; and Feinauer, Roland, 4,218,549, Cl. 525-420.000.
Winter, Hermann; Schroter, Gerhard; Jurgeleit, Wolfgang; Kalka, Josef; and Mihm, Bernhard, 4,218,553, Cl. 526-209.000.
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Hoff, Raymond E.; and Pullukat, Thomas J., 4,218,345, Cl. 252-458.000.
Chen, Thomas T., to Rockwell International Corporation. Magnetic bubble domain decoder organization. 4,218,761, Cl. 365-4.000.
Chevron Research Company: *See—*
Bacskai, Robert, 4,218,558, Cl. 528-315.000.
Koundakjian, Theodore H., 4,218,444, Cl. 424-212.000.
Vaughan, Ronald J., 4,218,328. Cl. 252-33.300.
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Robertson, Louis, 4,218,407, Cl. 261-64.00R.
Chika, John J. Configuration and construction of four wheeled motor vehicles. 4,217,970, Cl. 180-298.000.
Chikakiyo, Takao: *See—*
Kozima, Yusuke; Matsui, Hideo; and Chikakiyo, Takao, 4,218,201, Cl. 425-7.000.
Chin, Victor H.: *See—*
Allen, Francis K.; and Chin, Victor H., 4,218,758, Cl. 364-900.000.
Chin, Yi. Educational mechanical calculator. 4,218,609, Cl. 235-76.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; aad Hercsel, Jolan, nee Szepespataki, 4,218,404, Cl. 260-944.000.
Christensen, Burton G.; and Shih, David H., to Merck & Co., Inc. 6-(1-Hydroxyethyl)-2-(2-aminoethylthio)-1-substituted-1-carbadethiapen-2-em-3-carboxylic acids. 4,218,462, Cl. 424-274.000.
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Cama, Lovji D.; Christensen, Burton G.; and Guthikonda, Ravindra N., 4,218,459, Cl. 424-270.000.
Chu Associates: *See—*
Faigen, Ivan; and Ergene, Ahmet, 4,218,687, Cl. 343-885.000.
Chugoku Marine Paints, Ltd.: *See—*
Honjo, Satoru; Sawada, Kenichi; and Fukagawa, Masaki, 4,218,362, Cl. 260-40.00R.
Church, Brooks D., to Inpro, Inc. Two staged continuous fermentation process for production of heteropolysaccharide. 4,218,538, Cl. 435-101.000.
Ciba-Geigy Corporation: *See—*
Green, George E., 4,218,279, Cl. 156-272.000.
Stockinger, Friedrich; Eldin, Sameer H.; and Lohse, Friedrich, 4,218,377, Cl. 260-326.220.
Cicci, George B.; Markert, Leo A.; Ridge, George W.; and Lutz, Austin W., Jr., to International Harvester Company. Crop deflector. 4,217,746, Cl. 56-14.400.
Cipriani, Gioacchino: *See—*
Romano, Ugo; Tesei, Renato; Cipriani, Gioacchino; and Micucci, Lidio, 4,218,391, Cl. 260-463.000.
Citizen Watch Co., Ltd.: *See—*
Matsumura, Osamu, 4,217,752, Cl. 368-289.000.
Saito, Motoyuki, 4,218,601, Cl. 200-159.00R.
Shirasaki, Yuzo, 4,218,701, Cl. 357-72.000.
Claber S.p.A.: *See—*
Gianfranco, Roman, 4,218,017, Cl. 239-242.000.
Clamage, Herbert M. Display package for foliage. 4,217,982, Cl. 206-45.330.
Clark, Bob. Gasoline line lock. 4,217,925, Cl. 137-385.000.
Claus Koenig K.G.: *See—*
Koenig, Claus; and Koenig, Reinhard, 4,217,994, Cl. 222-212.000.
Clausing, Challiss I., to Gould Inc. Circuit breaker molded housing. 4,218,596, Cl. 200-144.00R.
Clavaud, Bernard A.: *See—*
Kiehl, Jean-Pierre; and Clavaud, Bernard A., 4,218,254, Cl. 106-44.000.
Clymer, John C.; and Eberhardt, Nikoli, to Bethlehem Steel Corporation. Magnetically shielded image dissector tube camera. 4,218,712, Cl. 358-229.000.
Coal Industry (Patents) Limited: *See—*
Finn, Michael J.; Ladner, William R.; and Newman, John O. H., 4,218,303, Cl. 208-8.00R.
Lewis, David C., 4,218,671, Cl. 340-21.000.
Cohen, David L., to Imperial Chemical Industries Limited. Process for preparing a polymeric film. 4,218,498, Cl. 427-336.000.
Coindet, Jacques; and Romand, Paul, to Crouzet. Robots. 4,218,173, Cl. 414-730.000.
Cole, Randall L. Metal roof panel structure. 4,217,741, Cl. 52-520.000.
Coleman, Michael D.: *See—*
Brundle, Leonard K.; Longley, Stuart R.; and Coleman, Michael D., 4,218,663, Cl. 333-17.00L.
Coloroll Limited: *See—*
Griffin, Gerald J. L., 4,218,350, Cl. 260-17.4ST.
Comai, Karen; Suilivan, Ann; and Westley, John, to Hoffmann-La Roche Inc. Polyether ionophores as antiobesity and hypotriglyceridemic agents. 4,218,443, Cl. 424-181.000.
Combustion Engineering, Inc.: *See—*
Angelini, Edward J., 4,217,861, Cl. 122-1.00R.
Combustion Research & Technology, Inc.: *See—*
Fort, Leonard N.; Albert, Albert F.; and Darragh, Edward P., 4,217,862, Cl. 123-472.000.
Come, Philippe, to Societe Anonyme D.B.A. Fluid reservoir. 4,217,922, Cl. 137-265.000.
Cominco Ltd.: *See—*
Charlton, Thomas L.; and Redden, Robert F., 4,218,425, Cl. 423-87.000.
Comiskey, William T. Fireplace grate. 4,217,879, Cl. 126-121.000.
Communications Satellite Corporation: *See—*
Assal, Tsvi F.; Berman, Arnold; and Mahle, Christoph E., 4,218,664, Cl. 333-156.000.
Compeau, Edward E., to General Motors Corporation. Passive seat belt system. 4,218,076, Cl. 280-804.000.
Compton, Leslie E., to Occidental Research Corporation. Removal of sulfur from shale oil. 4,218,309, Cl. 208-208.00R.
Conoco, Inc.: *See—*
Jackson, Robert G.; and Tillman, Richard M., 4,218,389, Cl. 260-449.500.
Stowell, Donald E.; Scamehorn, John F.; and Bendig, Larry L., 4,218,413, Cl. 264-13.000.
Consolidated Papers, Inc.: *See—*
Damrau, Wayne A., 4,217,769, Cl. 72-53.000.
Continental Carbon Company: *See—*
Dahmen, Karel R., 4,218,426, Cl. 423-210.000.
Continental Group, Inc., The: *See—*
Rarey, Kenneth W., 4,218,493, Cl. 427-27.000.
Continental Oil Company: *See—*
Theodore, Frank W., 4,218,288, Cl. 201-12.000.
Cook, C. Dale; Tyznik, William J.; and DeMarco, Peter F., to Detyzco, Inc. Frozen, nutritious pet food. 4,218,482, Cl. 426-72.000.

Cook, Lacy G.: *See*—
Withrington, Roger J.; Cook, Lacy G.; and Jones, Helene H., 4,218,111, Cl. 350-3.720.

Cooley, Leroy F.: *See*—
Smith, David S.; and Cooley, Leroy F., 4,218,137, Cl. 355-92.000.

Cooper, Albert D. Flower cup for grave marker. 4,217,729, Cl. 47-41.00G.

Cooper, Gary D.; and Brigman, Ronald D., to G.L.S. Partnership. Electronic system for playing bingo. 4,218,063, Cl. 273-237.000.

Cooper, Glenn D.; and Abolins, Visvaldis, to General Electric Company. Light stabilized polyphenylene ether resin composition. 4,218,364, Cl. 260-45.70P.

Corbeels, Roger J.: *See*—
Nolan, John T., Jr.; McMahon, Matthew A.; Kessler, Richard V.; and Corbeels, Roger J., 4,218,222, Cl. 48-202.000.

Cornaire, James L.; and Crabbs, Phillip R. Heat pump output indicator. 4,217,761, Cl. 62-130.000.

Cornelius Company, The: *See*—
Tracy, Gene A., 4,218,014, Cl. 239-106.000.

Costanza, Daniel W.; and Muck, Dennis N., to Xerox Corporation. Scanning carriage drive system. 4,218,127, Cl. 355-8.000.

Cottell, Eric C. Production of fuels. 4,218,221, Cl. 44-51.000.

Cox, Richard S.; and McGee, Paul D., to Motorola, Inc. Pushbutton radio tuner with illuminated pushbutton display. 4,218,775, Cl. 455-344.000.

Crabbs, Phillip R.: *See*—
Cornaire, James L.; and Crabbs, Phillip R., 4,217,761, Cl. 62-130.000.

Cramer, John J.: *See*—
Kappler, Frank R.; Cramer, John J.; and Kakar, Sarwan K., 4,218,220, Cl. 8-102.000.

Crawford, David R.; and McDonald, David M., to Simon-Johnson Inc. Poultry picking machine. 4,217,678, Cl. 17-11.10R.

Crawford, Ray V., to General Motors Corporation. Motor vehicle folding seat and seat occupant restraint arrangement. 4,218,074, Cl. 280-801.000.

Creech, Herman I., to Eaton Corporation. Sealed electric switch. 4,218,602, Cl. 200-302.000.

Cremeans, Jim G. Method for preventing fluid loss during drilling. 4,217,965, Cl. 175-72.000.

Crennan, Gerard: *See*—
Anderson, Arnold N.; and Crennan, Gerard, 4,218,104, Cl. 312-214.000.

Crest Industries, Inc.: *See*—
Rasmussen, Harry R.; and Kimzey, Gene A., 4,218,590, Cl. 179-99.00E.

Crone, John M., Jr., to Texaco Inc. Exhaust gas recycling system. 4,217,757, Cl. 60-288.000.

Cross, Peter E.: *See*—
Barnish, Ian T.; Cross, Peter E.; and Danilewicz, John C., 4,218,474, Cl. 424-319.000.

Crouch, William B.; Fabiero nee Posadas, Carolina Z.; and Robin, Allen M., to Texaco Inc. Production of nitrogen-rich gas mixtures. 4,218,326, Cl. 252-8.55D.

Crouch, Willie W.: *See*—
Drake, Charles A.; and Crouch, Willie W., 4,218,394, Cl. 260-465.80R.

Crouzet: *See*—
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Crystal Systems, Inc.: *See*—
Schmid, Frederick; and Khattak, Chandra P., 4,218,418, Cl. 264-299.000.

Csapo, Michael A., to Selas Corporation of America. Thermally conductive partition. 4,218,213, Cl. 432-249.000.

Cuffiani, Illaro: *See*—
Zucchini, Umberto; and Cuffiani, Illaro, 4,218,339, Cl. 252-429.00B.

Curtis, Raymond: *See*—
Mills, Frederick; Hopley, Eric T.; Curtis, Raymond; and Wraighte, Patrick M., 4,217,988, Cl. 215-21.000.

Cymbal, William D., to General Motors Corporation. Electrical connector arrangement for motor vehicle steering assembly. 4,218,073, Cl. 280-731.000.

D/FW Plastics: *See*—
Pickens, Jay W., 4,218,028, Cl. 242-55.200.

Dahmen, Karel R., to Continental Carbon Company. Method and apparatus for the combustion of waste gases. 4,218,426, Cl. 423-210.000.

Daido, Toshihiko; Koreeda, Kiyoshi; Kunimatsu, Hiroshi; and Tabata, Kinji, to Koyo Seiko Company Limited; and Koyo Machine Industries Company Limited. Speed control apparatus for use with electric sewing machine. 4,217,841, Cl. 112-277.000.

Daimler-Benz Aktiengesellschaft: *See*—
Weisshappel, Helmut; and Schmid, Walter, 4,218,672, Cl. 340-52.00R.

Dainippon Ink & Chemicals Inc.: *See*—
Shimamatsu, Hidenori; and Tominaga, Yutaka, 4,217,728, Cl. 47-1.400.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Kobayashi, Akio; Shimohiro, Yoshiyuki; Shimizu, Kisaburou; and Murakami, Yoshiaki, 4,218,366, Cl. 528-143.000.

Dairyland Food Laboratories, Inc.: *See*—
LaBelle, Gerald G.; and Staehler, Glenn E., 4,218,534, Cl. 435-5.000.

Dalisa, Andrew L.; and Seymour, Robert J., to U.S. Philips Corporation. Electrophoretic display devices. 4,218,302, Cl. 204-299.00R.

Dall-Winther, Dennis P. Windmill. 4,218,183, Cl. 416-41.000.

Dallas, Charles: *See*—
Lerner, Marc; and Dallas, Charles, 4,217,930, Cl. 137-587.000.

Damrau, Wayne A., to Consolidated Papers, Inc. Method of forming a coating application roll. 4,217,769, Cl. 72-53.000.

Danilewicz, John C.: *See*—
Barnish, Ian T.; Cross, Peter E.; and Danilewicz, John C., 4,218,474, Cl. 424-319.000.

Dannelly, Clarence C., to Eastman Kodak Company. Encapsulating method. 4,218,409, Cl. 264-4.000.

Dantoni, Joseph L. Method of making animal litter. 4,217,858, Cl. 119-1.000.

Darley, Kenneth S.: *See*—
Dyson, David V.; Darley, Kenneth S.; and Fenn, Michael A. F., 4,218,480, Cl. 426-19.000.

Darragh, Edward P.: *See*—
Fort, Leonard N.; Albert, Albert F.; and Darragh, Edward P., 4,217,862, Cl. 123-472.000.

Dasy Inter S.A.: *See*—
Brosow, Jorgen; and Furugard, Erik, 4,218,674, Cl. 340-149.00A.

Data General Corporation: *See*—
Hendrie, Gardner C., 4,218,753, Cl. 364-900.000.

Data Printer Corporation: *See*—
Schaeffer, Timothy N., 4,218,754, Cl. 364-900.000.

Daubach, Ewald; Herrmann, Manfred; Oppenlaender, Knut; and Stork, Karl, to BASF Aktiengesellschaft. Stable finely dispersed aqueous formulations of disperse dyes and optical brighteners, and their use. 4,218,218, Cl. 8-550.000.

Davis, H. G.: *See*—
Albright, Charles W.; and Davis, H. G., 4,218,287, Cl. 201-9.000.

Davison, Charles A. Shower head fluid dispenser. 4,218,013, Cl. 239-74.000.

Davitz, Walter E., to Production Plus Corporation. Hanging rack for finishing system. 4,217,853, Cl. 118-500.000.

Davy International (Oil & Chemicals) Limited: *See*—
Newrick, George M., 4,218,311, Cl. 210-21.000.

Dayco Corporation: *See*—
Hollaway, Gerald C., Jr.; and Brooks, Alden W., 4,217,680, Cl. 19-0.460.
Jacob, Richard J.; and Wolk, Reuben, 4,218,420, Cl. 264-570.000.

De Lorean Manufacturing Company: *See*—
Thompson, James A., 4,218,101, Cl. 305-35.0EB.

Dean, Thomas. Garden roller capable of storing and dispensing liquids. 4,218,015, Cl. 239-147.000.

DEC International, Inc.: *See*—
Hazen, Gretz L., 4,217,818, Cl. 99-456.000.

Decorzant, Rene: *See*—
Naf, Ferdinand; and Decorzant, Rene, 4,218,347, Cl. 252-522.00R.

de Cremoux, Baudouin, to Thomson-CSF. Light-emitting and light-receiving diode particularly for optical telecommunications. 4,218,692, Cl. 357-19.000.

Deere & Company: *See*—
Fox, Robert E., 4,217,835, Cl. 111-85.000.

Deffeyes, Robert J.; and Johnson, Grover L., to Graham Magnetics, Inc. Coated particles and process of preparing same. 4,218,507, Cl. 428-328.000.

Defore, Leroy A.: *See*—
Beasley, Max M.; Defore, Leroy A.; and King, Hugh C., 4,217,837, Cl. 112-79.00R.

Deforeit, Christian J. Polyphonic digital synthesizer. 4,217,802, Cl. 84-1.010.

De Gaetano, Mario: *See*—
Siclari, Francesco; Rossi, Pietro P.; and De Gaetano, Mario, 4,218,399, Cl. 260-583.00P.

Degen, Bruno: *See*—
Maas, Joachim; Mundil, Rudolf; Degen, Bruno; and Moretto, Hans-Heinrich, 4,218,387, Cl. 556-412.000.

DeGraw, Joseph I.; Lawson, John A.; Johnson, Howard L.; Loew, Gilda H.; and Berkowitz, Donald A., to SRI International. N-αMethylcyclopropylmethyl derivatives of normorphine and noroodeine, and analgesic compositions and methods employing the normorphine derivatives. 4,218,454, Cl. 424-260.000.

DeHart, John R.: *See*—
Krehl, William H.; and DeHart, John R., 4,218,612, Cl. 235-449.000.

de Jong, Aaldert J.: *See*—
Mulder, Albertus J.; and de Jong, Aaldert J., 4,218,348, Cl. 252-522.000.

DeJong, Allen W., to Canadian Fram Ltd. Electromagnetic band clutch. 4,217,976, Cl. 192-84.00T.

DeLaval Turbine, Inc.: *See*—
Wood, Richard F., Jr., 4,217,814, Cl. 91-453.000.

Della Mura, Pasquale: *See*—
Kuppers, Walter; and Della Mura, Pasquale, 4,218,483, Cl. 426-72.000.

DeMarco, Peter F.: *See*—
Cook, C. Dale; Tyznik, William J.; and DeMarco, Peter F., 4,218,482, Cl. 426-72.000.

Denizot, Andre: *See*—
Brocard, Francois; Denizot, Andre; and Dif, Marcel, 4,218,702, Cl. 358-109.000.

Denki Onkyo Co., Ltd.: *See*—
Masuda, Noboru; and Suzuki, Mitsuyuki, 4,217,779, Cl. 73-313.000.

Dent, John R., to United States of America, Army. Radar fuzing system. 4,217,827, Cl. 102-214.000.

Design Cote Corp.: *See*—
Brack, Karl, 4,218,294, Cl. 204-159.130.

Detweiler, Charles A., to Schmelzer Corporation. Automatic choke control. 4,218,406, Cl. 261-39.00B.

Detyzco, Inc.: *See*—
Cook, C. Dale; Tyznik, William J.; and DeMarco, Peter F., 4,218,482, Cl. 426-72.000.

Deuringer, Rainer: *See*—
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Deuterium Corporation: *See*—
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Isaac, Otto; Posselt, Klaus; Uthemann, Horst; and Thiemer, Klaus, 4,218,447, Cl. 424-241.000.
Knosp, Helmut, 4,218,244, Cl. 75-165.000.
Lakatos, Eduard; Koberstein, Edgar; Hensel, Jorg; and Bozon, Alfred, 4,218,341, Cl. 252-430.000.

DeVault, Robert L.: *See*—
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Dezelan, Joseph E., to Caterpillar Tractor Co. Closed center emergency steering with accumulator source. 4,217,968, Cl. 180-133.000.

Dickmanns, Heinz: *See*—
Nagl, Gert; Ribka, Joachim; Dickmanns, Heinz; and Gotsmann, Ulrich, 4,218,219, Cl. 8-652.000.

Dieudonne, Marc P. G., to Le Materiel Telephonique. Digital signal switching system. 4,218,588, Cl. 370-59.000.

Dif, Marcel: *See*—
Brocard, Francois; Denizot, Andre; and Dif, Marcel, 4,218,702, Cl. 358-109.000.

DiGiacomo, Hector L.; and Sacco, John A., to General Battery Corporation. Industrial battery stack. 4,218,526, Cl. 429-138.000.

Dillemuth, Arnold H. Door holding latch. 4,218,083, Cl. 292-262.000.

Dillon, Peter L. P.: *See*—
Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., 4,218,713, Cl. 360-36.000.

Dischert, Robert A.; and Libbey, Robert L., to RCA Corporation. Black level control system for a color television camera. 4,218,699, Cl. 358-29.000.

Display Corporation International: *See*—
Nasgowitz, Donald D., 4,217,985, Cl. 211-50.000.

Dixon, Jerry D.; and Leininger, Joel C., to International Business Machines Corporation. Paging mechanism. 4,218,741, Cl. 364-200.000.

Dobozy, Otto: *See*—
Nadasy, Miklos; Kovacs, Miklos; Kolcsei, Marton; Vad, Janos; Bartha, Bela; Dobozy, Otto; Mate, Ferenc; and Karacsonyi nee Spindler, Eva, 4,218,234, Cl. 71-86.000.

Dockner, Toni: *See*—
Fleig, Helmut; Hagen, Helmut; Dockner, Toni; and Kohlmann, Friedrich W., 4,218,460, Cl. 424-270.000.

Docutronix, Inc.: *See*—
Krehl, William H.; and DeHart, John R., 4,218,612, Cl. 235-449.000.

Dodds, Philip V. W., to ARP Instruments, Inc. Piano-action keyboard. 4,217,803, Cl. 84-1.100.

Dodson, Stuart A.: *See*—
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,218,450, Cl. 424-248.540.

Dolhyj, Serge R.; and Velenyi, Louis J., to Standard Oil Company. Process for the production of polyphenyls. 4,218,572, Cl. 585-400.000.

Dolhyj, Serge R.: *See*—
Milberger, Ernest C.; Dolhyj, Serge R.; and Bremer, Noel J., 4,218,382, Cl. 260-346.750.

Don Carlos, Alva G., to Hallmark Cards, Incorporated. Fibreboard box closure. 4,218,009, Cl. 229-39.00R.

Donaldson Company, Inc.: *See*—
Frey, Robert E., 4,218,227, Cl. 55-302.000.
Lidstone, James E.; and Osendorf, Richard J., 4,218,223, Cl. 55-1.000.

Donohue, James A., to Outboard Marine Corporation. Compression reducing system for an internal combustion engine. 4,217,796, Cl. 74-860.000.

Donzis, Byron A. Self-contained fluid pressure foot support device. 4,217,705, Cl. 36-29.000.

Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., to BBC Brown, Boveri & Company, Limited. Manufacturing process for an electrooptic display device. 4,218,281, Cl. 156-281.000.

Doster, Martha S.; and Kudchadker, Mohan V., to Texaco Inc. Sacrificial agents for petroleum recovery processes. 4,217,958, Cl. 166-274.000.

Dott. Formenti S.p.A.: *See*—
Milani, Davide, 4,218,467, Cl. 424-281.000.

Douglas, George H.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Method for treatment of gastrointestinal spasmodic disease conditions or symptoms in mammals. 4,218,450, Cl. 424-248.540.

Douglas, Gerald A., to Douglas Industries, Inc. Jointure apparatus for tennis screen structures. 4,218,047, Cl. 256-1.000.

Douglas Industries, Inc.: *See*—
Douglas, Gerald A., 4,218,047, Cl. 256-1.000.

Dow Chemical Company, The: *See*—
Henton, David E., 4,218,544, Cl. 525-67.000.
Lee, George A., 4,218,295, Cl. 204-159.230.
Meyer, Victor E.; and Stevens, Rex R., 4,218,516, Cl. 428-537.000.
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., 4,218,383, Cl. 260-346.750.
Sun, Yun C., 4,218,224, Cl. 55-20.000.
Wagner, Eugene R.; Matthews, Donald P.; and Renzi, Alfred A., 4,218,475, Cl. 424-319.000.
Wymore, C. Elmer, 4,218,401, Cl. 567-402.000.

Dow Corning Corporation: *See*—
Kasprzak, Kenneth A., 4,218,250, Cl. 106-3.000.

Downing, Brian Y.; and Hamer, George D., to British Industrial Plastics Limited. Polyester resins. 4,218,546, Cl. 525-170.000.

Drafahl, Jack W., Jr. Light-handle. 4,218,122, Cl. 354-293.000.

Dragan, William B. Orthodontic O-ring and ligator therefore. 4,217,686, Cl. 29-413.000.

Drake, Charles A.; and Crouch, Willie W., to Phillips Petroleum Company. Preparation of unsaturated nitriles. 4,218,394, Cl. 260-465.80R.

Dravo Corporation: *See*—
Briggs, Aubrey C., 4,217,981, Cl. 198-839.000.

Drechsel, Dietrich: *See*—
Floymayr, Joachim; Jericho, Karl; Drechsel, Dietrich; and Bubeck, Friedrich, 4,218,424, Cl. 422-249.000.

Dreher, Karl: *See*—
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.

Drogichen, Daniel P., to Burroughs Corporation. Device for automatic modification of ROM contents by a system selected variable. 4,218,757, Cl. 364-900.000.

Druschel, William O. Rotary cutting tool with offset cutting element. 4,218,163, Cl. 408-196.000.

Duce, Benjamin R.: *See*—
Boyes, Robert N.; Duce, Benjamin R.; Smith, Emil R.; and Byrnes, Eugene W., 4,218,477, Cl. 424-324.000.

Ductmate Industries, Inc.: *See*—
Arnoldt, Peter J., 4,218,079, Cl. 285-331.000.

Dumont, Claude: *See*—
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,218,375, Cl. 260-330.300.

Dunkleberger, LaRue N., to Bell Telephone Laboratories, Incorporated. Photolithographic technique for depositing thin films. 4,218,532, Cl. 430-314.000.

Dunn, Bruce S.; Breiter, Manfred W.; and King, Randall N., to Electric Power Research Institute, Inc. In-situ preparation of the sulfur electrode for sodium-sulfur batteries. 4,218,524, Cl. 429-104.000.

Du Pont de Nemours, E. I., and Company: *See*—
Aldrich, Paul E.; and Berezin, Gilbert H., 4,218,448, Cl. 424-244.000.
Moore, Earl P., Jr., 4,218,371, Cl. 260-192.000.

Dura Corporation: *See*—
Jones, Raymond E., 4,217,972, Cl. 187-8.410.

Durant, Graham J.: *See*—
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,218,452, Cl. 424-251.000.

Durr, Helmut E.; and Wright, James G., Jr., to Western Electric Company, Inc. Methods of pulp-insulating a conductor. 4,218,285, Cl. 162-106.000.

Dutcher, Robert G., to Medtronic, Inc. Body-implantable lead with protected, extendable tissue securing means. 4,217,913, Cl. 128-785.000.

Dworak, Ulf; and Olapinski, Hans, to Feldmuhle Aktiengesellschaft. Sintered ceramic material of improved ductility. 4,218,253, Cl. 106-43.000.

Dyna-Plastik Werke GmbH: *See*—
Stark, Gerd, 4,217,945, Cl. 160-236.000.

Dyson, David V.; Darley, Kenneth S.; and Fenn, Michael A. F., to Griffith Laboratories, Limited, The. Production of particulated stale bread. 4,218,480, Cl. 426-19.000.

Dzioba, Donald L.; and Eckhardt, Dennis C., to General Motors Corporation. Lash compensator for power steering gear. 4,217,811, Cl. 91-375.00A.

E. R. Squibb & Sons, Inc.: *See*—
Haugwitz, Rudiger D.; and Maurer, Barbara V., 4,218,396, Cl. 260-552.00R.
Hoehn, Hans, 4,218,461, Cl. 424-273.00R.

Earnest, Melvin F.: *See*—
Lemmon, Robert G., Jr.; and Earnest, Melvin F., 4,218,231, Cl. 65-99.00A.

Eastman Kodak Company: *See*—
Dannelly, Clarence C., 4,218,409, Cl. 264-4.000.
Hinshaw, Jerald C.; and Henzel, Richard P., 4,218,368, Cl. 260-156.000.
Holmes, Jerry D., 4,218,340, Cl. 252-429.00R.
Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., 4,218,713, Cl. 360-36.000.
Smith, David S.; and Cooley, Leroy F., 4,218,137, Cl. 355-92.000.

Eaton Corporation: *See*—
Creech, Herman I., 4,218,602, Cl. 200-302.000.

Eaton, Russell K., to Stryker Corporation. Forward and reverse rotary tool. 4,217,964, Cl. 173-163.000.

Eberhardt, Nikoli: *See*—
Clymer, John C.; and Eberhardt, Nikoli, 4,218,712, Cl. 358-229.000.

Echolabs, Inc.: *See*—
Baxter, Larry K.; and Brickman, A. Donald, 4,218,709, Cl. 358-181.000.

Eckel, John D., to A. Y. McDonald Mfg. Co. Ball valve construction. 4,218,042, Cl. 251-288.000.

Ecker, Amir L., to Atlantic Richfield Company. Heat exchanger-accumulator. 4,217,765, Cl. 62-503.000.

Eckhardt, Dennis C.: *See*—
Dzioba, Donald L.; and Eckhardt, Dennis C., 4,217,811, Cl. 91-375.00A.
Eckley, Kenneth E., to Carrier Corporation. Apparatus for housing a shaft coupling. 4,217,767, Cl. 64-32.00R.
Eder, Heinz: *See*—
Boehm, Ernst; and Eder, Heinz, 4,218,022, Cl. 241-101.700.
Edgar, Owen B.; and Yates, Michael R., to Imperial Chemical Industries, Limited. Polyamide copolymers. 4,218,509, Cl. 528-339.000.
Edwards, Frederick H., to Vinyl Clad Proprietary Limited. Labelling. 4,218,204, Cl. 425-129.00R.
Egerbacher, Werner; Martin, Heinz; Mitzkus, Werner; and Wunderlich, Dieter, to Siemens Aktiengesellschaft. Semiconductor rectifier housing assembly. 4,218,695, Cl. 357-79.000.
Egli, Ernst; Bombelli, Nino; and Misteli, Max, to Spribag Aktiengesellschaft; and Von Roll AG. Apparatus and methods for automatically lining containers, especially casting ladles. 4,218,050, Cl. 266-281.000.
Egloff, Markus: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., 4,218,281, Cl. 156-281.000.
Eiden, Sidney W. Field marker. 4,218,059, Cl. 273-25.000.
Eiermann, Dankwart, to Borsig GmbH; and Wankel GmbH. Rotary piston compressor with no negative torque. 4,218,199, Cl. 418-54.000.
Eisenbach, Dieter; and Gosewinkel, Werner, to Boehringer Mannheim GmbH. Process for the separation of triphenylphosphine rhodium halide catalysts. 4,218,336, Cl. 252-411.00R.
Eitoshi, Shozi: *See*—
Kooichi, Yoshida; Eitoshi, Shozi; Hiroshi, Ootaki; and Takashi, Terada, 4,218,433, Cl. 424-15.000.
Elder, J. Mark; and Ruether, Peter G., to Storage Technology Corporation. Complex signal generation and transmission. 4,218,587, Cl. 370-81.000.
Eldin, Sameer H.: *See*—
Stockinger, Friedrich; Eldin, Sameer H.; and Lohse, Friedrich, 4,218,377, Cl. 260-326.220.
Electric Power Research Institute, Inc.: *See*—
Dunn, Bruce S.; Breiter, Manfred W.; and King, Randall N., 4,218,524, Cl. 429-104.000.
Putt, Ronald A.; and Montgomery, Mark J., 4,218,521, Cl. 429-39.000.
Eli Lilly and Company: *See*—
Callender, Maurice E.; and Jeffers, Thomas K., 4,218,438, Cl. 424-115.000.
Taylor, Harold M.; and Suhr, Robert G., 4,218,238, Cl. 71-94.000.
Ellingwood, Robert G.: *See*—
Buscher, David J.; Ellingwood, Robert G.; and Ressler, Marc A., 4,218,737, Cl. 364-493.000.
Ellis, Haynes, Jr.: *See*—
United States of America, National Aeronautics and Space Administration; and Ellis, Haynes, Jr., 4,218,685, Cl. 343-727.000.
Ellis, Henry D.; and Benjamen, Lysle I., to Ellis, Henry D. Blasting media and method of manufacture comprising polycarbonate and ethylene-carbon monoxide-vinyl acetate terpolymer. 4,218,547, Cl. 525-148.000.
El Mouchi, Daniel. Track lighting apparatus. 4,218,108, Cl. 339-82.000.
Elsbett, Gunter: *See*—
Elsbett, Ludwig; and Elsbett, Gunter, 4,217,875, Cl. 123-188.00S.
Elsbett, Ludwig; and Elsbett, Gunter. Cylinder head for internal combustion engines, especially diesel engines. 4,217,875, Cl. 123-188.00S.
Eltec Instruments, Inc.: *See*—
Oettel, Friedrich H., 4,218,620, Cl. 250-338.000.
Ely, Jeffrey A.: *See*—
Madsen, Wayne A.; Kibler, Roland G.; and Ely, Jeffrey A., 4,217,867, Cl. 123-350.000.
Ember, Jean B. Constant reminder memorandum device. 4,218,077, Cl. 283-2.000.
Emery Industries, Inc.: *See*—
Harris, Eugene G.; and White, John F., 4,218,379, Cl. 260-340.200.
Emmett, John C.: *See*—
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,218,452, Cl. 424-251.000.
Emmett, Robert C., Jr.; and Tuttle, Lawrence L., to Envirotech Corporation. Countercurrent washer. 4,217,916, Cl. 134-104.000.
Emo, George C., to Bell Telephone Laboratories, Incorporated. Connector contact contamination probe. 4,218,653, Cl. 324-421.000.
Empacher, K. Dietrich: *See*—
Hood, Frederick E.; and Empacher, K. Dietrich, 4,217,845, Cl. 114-125.000.
Engel, Kurt; and Spannlang, Ronald, to Voest-Alpine Aktiengesellschaft. Continuous casting strand guide roller. 4,217,951, Cl. 164-448.000.
Engeler, William E.: *See*—
Papadofrangakis, Emmanuel; and Engeler, William E., 4,217,909, Cl. 128-663.000.
English Electric Company Limited, The: *See*—
Lee, Alan S., 4,218,078, Cl. 285-115.000.
Ennis, Colin S.: *See*—
Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; and Wheldon, Alfred G., 4,218,491, Cl. 426-600.000.
Ensco, Inc.: *See*—
Fowler, James C.; Rubin, Llewellyn A.; and Still, William L., 4,218,678, Cl. 343-5.0FT.
Enso-Gutzeit Osakeyhtio: *See*—
Kilpelainen, Ossi, 4,217,917, Cl. 134-104.000.
Entwistle, Ian D., to Shell Oil Company. Herbicidal esters of N-alkylpropanamides. 4,218,239, Cl. 71-115.000.
Envirotech Corporation: *See*—
Emmett, Robert C., Jr.; and Tuttle, Lawrence L., 4,217,916, Cl. 134-104.000.
Erfer, David. Writing instrument with self-closure. 4,218,154, Cl. 401-107.000.
Ergene, Ahmet: *See*—
Faigen, Ivan; and Ergene, Ahmet, 4,218,687, Cl. 343-885.000.
Ernst Leitz Wetzlar GmbH: *See*—
Bletz, Walter, 4,218,613, Cl. 250-214.00A.
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., to Owens-Illinois, Inc. Gas discharge device. 4,218,632, Cl. 313-218.000.
Esashi, Masayoshi: *See*—
Shimada, Kiyoo; Matuo, Masayuki; and Esashi, Masayoshi, 4,218,298, Cl. 204-195.00M.
Escales, Eberhard; Hell, August; Schubert, Andreas; and Weber, Klaus, to AGFA-Gevaert, A.G. Apparatus for processing developed photographic films and prints. 4,217,743, Cl. 53-54.000.
Eschenberg, Rudolf; and Schafer, Herbert, to Thyssen Aktiengesellschaft Vorm. August Thyssen-Mutte. Refractory front wall for industrial furnace. 4,218,212, Cl. 432-247.000.
Etablissements Armor, S.A.: *See*—
Weidner, Richard K., 4,218,155, Cl. 401-132.000.
Etablissements Francois Salomon et Fils: *See*—
Salomon, Georges P. J., 4,218,071, Cl. 280-630.000.
Ethyl Corporation: *See*—
Shubkin, Ronald L., 4,218,330, Cl. 252-46.600.
Etoh, Yuichi; Kitayama, Akira; Kobayashi, Sadami; and Okazaki, Shigeyoshi, to Idemitsu Kosan Company Limited. Process for removing chlorine ions from the wet flue-gas processing system. 4,218,428, Cl. 423-242.000.
Evans, Daniel D. Roof louver apparatus. 4,217,742, Cl. 52-553.000.
Evans, James M.; and Ortiz, Carlos E., to SCM Corporation. Product of and process for polymerizing an aqueous reaction mixture containing ionizing agent and cosolvent that forms an aqueous dispersion of resinous polyelectrolyte. 4,218,356, Cl. 260-29.6TA.
Exall, Douglas I.: *See*—
Goss, Michael J.; and Exall, Douglas I., 4,217,956, Cl. 166-272.000.
Extracorporeal Medical Specialties, Inc.: *See*—
Aid, James D.; and Lee, Kyu H., 4,218,313, Cl. 210-22.00A.
Ezoe, Mitsuhiko, to Nissan Motor Company, Limited. Fuel injection system equipped with a fuel increase command signal generator for an automotive internal combustion engine. 4,217,863, Cl. 123-494.000.
F. Jos. Lamb Company: *See*—
Stalker, Neil J., 4,217,978, Cl. 198-345.000.
Fabiero nee Posadas, Carolina Z.: *See*—
Crouch, William B.; Fabiero nee Posadas, Carolina Z.; and Robin, Allen M., 4,218,326, Cl. 252-8.55D.
Faigen, Ivan; and Ergene, Ahmet, to Chu Associates. Broadband dipole antenna system with coaxial feed-line coated with ferrite particles to reduce line currents. 4,218,687, Cl. 343-885.000.
Faivre, Claude. Apparatus for catching and lifting live fish. 4,217,718, Cl. 43-6.500.
Fansteel Inc.: *See*—
Arnold, Leonard R., 4,218,160, Cl. 407-114.000.
Farha, Floyd, Jr.: *See*—
Walker, Darrell W.; Hogan, Robert J.; and Farha, Floyd, Jr., 4,218,343, Cl. 252-435.000.
Farha, Floyd E., Jr.: *See*—
Walker, Darrell W.; and Farha, Floyd E., Jr., 4,218,346, Cl. 252-475.000.
Faris, W. Frank. Candle lathe. 4,217,799, Cl. 82-1.00C.
Farmitalia Carlo Erba S.p.A.: *See*—
Penco, Sergio; Franchi, Giuliano; and Arcamone, Federico, 4,218,440, Cl. 424-180.000.
Faso, Joseph M. Prosthesis and method for creating a stoma. 4,217,664, Cl. 3-1.000.
Fast Food Fabricators, Inc.: *See*—
Meamber, Jon F., 4,217,817, Cl. 99-349.000.
Faunce and Associates, Inc.: *See*—
Faunce, Stuart F.; and Faust, Elbert R., 4,217,918, Cl. 134-133.000.
Faunce, Stuart F.; and Faust, Elbert R., 4,217,919, Cl. 134-133.000.
Faunce, Stuart F.; and Faust, Elbert R., to Faunce and Associates, Inc. Ratchet conveyor system. 4,217,918, Cl. 134-133.000.
Faunce, Stuart F.; and Faust, Elbert R., to Faunce and Associates, Inc. Ratchet conveyor and electrical energy cleaning system. 4,217,919, Cl. 134-133.000.
Faust, Elbert R.: *See*—
Faunce, Stuart F.; and Faust, Elbert R., 4,217,918, Cl. 134-133.000.
Faunce, Stuart F.; and Faust, Elbert R., 4,217,919, Cl. 134-133.000.
Federighi, George B.: *See*—
Federighi, George J.; and Federighi, George B., 4,218,264, Cl. 134-95.000.
Federighi, George J.; and Federighi, George B. Dishwasher utilizing pump impeller suction for feeding detergent, sanitizing agent and rinse aid in timed sequences. 4,218,264, Cl. 134-95.000.
Fefferman, Frank J., to Stylar Industries, Inc. Convertible seat. 4,217,669, Cl. 5-47.000.
Fein, Michael E.: *See*—
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,218,632, Cl. 313-218.000.
Feinauer, Roland: *See*—
Jadamus, Hans; Mumcu, Salih; Burzin, Klaus; Feldmann, Rainer; and Feinauer, Roland, 4,218,549, Cl. 525-420.000.

Feist, Wolf-Dieter; and Zech, Herbert, to MTU Motoren-und Turbinen Union Munchen GmbH. Method of manufacturing structural components. 4,218,273, Cl. 156-60.000.

Felder, Eugene H., Jr.: *See—*
Hitchcock, Melvin L.; Ray, Ralph D.; and Felder, Eugene H., Jr., 4,218,669, Cl. 335-258.000.

Feldman, Karl T., Jr. Passive solar heat collector. 4,217,882, Cl. 126-433.000.

Feldmann, Rainer: *See—*
Jadamus, Hans; Mumcu, Salih; Burzin, Klaus; Feldmann, Rainer; and Feinauer, Roland, 4,218,549, Cl. 525-420.000.

Feldmuhle Aktiengesellschaft: *See—*
Dworak, Ulf; and Olapinski, Hans, 4,218,253, Cl. 106-43.000.

Fellman, Jack D.; Kaufman, Harvey L.; and Stobbe, Alan W., to McGean Chemical Company, Inc. Bright zinc electroplating bath and method. 4,218,292, Cl. 204-55.00R.

Fenn, Michael A. F.: *See—*
Dyson, David V.; Darley, Kenneth S.; and Fenn, Michael A. F., 4,218,480, Cl. 426-19.000.

Ferranti Limited: *See—*
Liebing, Alan P.; Scott, James N. G.; and Shackleton, Brian R., 4,217,787, Cl. 74-5.60D.

Ferrari, Giorgio: *See—*
Casagrande, Cesare; and Ferrari, Giorgio, 4,218,470, Cl. 424-311.000.

Fetty, Rosabelle: *See—*
Fetty, Warren N.; and Fetty, Rosabelle, 4,217,727, Cl. 46-257.000.

Fetty, Warren N.; and Fetty, Rosabelle. Miniature monorail system. 4,217,727, Cl. 46-257.000.

Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel, Jolan, nee Szepespataki, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. ω-Aminocarboxylic acid amides. 4,218,404, Cl. 260-944.000.

Feyen, Peter; Konig, Hans-Bodo; and Metzger, Karl G., to Bayer Aktiengesellschaft. Penicillins and their use. 4,218,451, Cl. 424-250.000.

Fiege, Helmut; Wedemeyer, Karlfried; Bauer, Kurt; and olleken, Reiner, to Bayer Aktiengesellschaft. Process for the preparation of arylglyoxylic acids. 4,218,380, Cl. 260-340.50R.

Finger, Carl, to Rutgerswerke Aktiengesellschaft. Process for the production of fluorenone by catalytic oxidation of fluorene. 4,218,400, Cl. 568-321.000.

Finger, John F., to Sioux Steam Cleaner Corporation. Liquid solar heat collector. 4,217,888, Cl. 126-450.000.

Finger, John F. Cleaning system having steam and water mixing ejector. 4,217,924, Cl. 137-334.000.

Finn, Bernard J.; Steger, Charles B.; and Reid, Kenneth H., to General Motors Corporation. Lockbar release for inertia locking seat belt retractor. 4,218,033, Cl. 242-107.40A.

Finn, Michael J.; Ladner, William R.; and Newman, John O. H., to Coal Industry (Patents) Limited. Coal pyrolysis. 4,218,303, Cl. 208-8.00R.

Firestone Tire & Rubber Company, The: *See—*
Hergenrother, William L.; and Halasa, Adel F., 4,218,556, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,218,557, Cl. 528-168.000.

Firmenich SA: *See—*
Naf, Ferdinand; and Decorzant, Rene, 4,218,347, Cl. 252-522.00R.
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,218,488, Cl. 426-536.000.

Firth, Ronald R.: *See—*
Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., 4,218,713, Cl. 360-36.000.

Fischer, Richard V., to Polaroid Corporation. Audio system vibration isolation arrangement for photographic viewer. 4,218,117, Cl. 352-72.000.

Fisher, Charles B.; and Fisher, Sidney T. Safe wire rope. 4,217,748, Cl. 57-212.000.

Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,217,748, Cl. 57-212.000.

Fitzpatrick, Francis A., to Upjohn Company, The. Compounds and methods. 4,218,436, Cl. 424-85.000.

Flameless Furnaces Ltd.: *See—*
Pearce, Arnold P., 4,217,834, Cl. 110-165.00R.

Flasch, John R.: *See—*
Hayati, Hossein; and Flasch, John R., 4,218,354, Cl. 260-29.20M.

Fleig, Helmut; Hagen, Helmut; Dockner, Toni; and Kohlmann, Friedrich W., to BASF Aktiengesellschaft. Nitroimidazoles. 4,218,460, Cl. 424-270.000.

Flicker, Alcwyn; Gay, Derek J.; Rhodes, Tony; and Sweet, Roger H., to Mattel, Inc. Doll with movable legs, head, tiltable torso. 4,217,726, Cl. 46-120.000.

Flock, John W.: *See—*
Vakil, Himanshu B.; and Flock, John W., 4,217,760, Cl. 62-114.000.

Floymayr, Joachim; Jericho, Karl; Drechsel, Dietrich; and Bubeck, Friedrich, to Leybold-Heraeus GmbH & Co. KG. Apparatus for the zone pulling of monocrystal rods. 4,218,424, Cl. 422-249.000.

Flynn, Patrick F.: *See—*
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., 4,218,455, Cl. 424-263.000.
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., 4,218,456, Cl. 424-263.000.

Foley, William M., Jr. Process for preparing hydrogel contact lenses containing quaternary ammonium salts. 4,218,554, Cl. 526-264.000.

Folk, Edwin W.: *See—*
Armstrong, Arthur A.; Baur, Gerd R.; Carpenter, Charles N.; Folk, Edwin W.; Stookey, Donald J.; and Voges, Robert L., 4,218,358, Cl. 260-32.60N.

Ford Motor Company: *See—*
Grzybowski, James P., 4,218,694, Cl. 357-76.000.
Palamountain, Bruce F., 4,218,037, Cl. 248-481.000.
Schock, Donald N.; and Schwalbach, Hans G., 4,218,422, Cl. 422-171.000.
Timmons, William K.; and Koss, George A., 4,217,992, Cl. 221-113.000.

Forrest, Charles P. Football training device. 4,218,060, Cl. 273-55.00R.

Forsman Armerad Plast AB: *See—*
Forsman, Hans E., 4,217,999, Cl. 224-319.000.

Forsman, Hans E., to Forsman Armerad Plast AB. Skicase. 4,217,999, Cl. 224-319.000.

Forsyth, Paul F.: *See—*
McMurtry, Carl H.; Naum, Robert G.; and Forsyth, Paul F., 4,218,622, Cl. 250-518.000.

Fort, Leonard N.; Albert, Albert F.; and Darragh, Edward P., to Combustion Research & Technology, Inc. High constant pressure, electronically controlled diesel fuel injection system. 4,217,862, Cl. 123-472.000.

Fosti, James E.: *See—*
Sigmund, Phillip M.; Lee, Jong I.; and Fosti, James E., 4,217,955, Cl. 166-252.000.

Fowler, James C.; Rubin, Llewellyn A.; and Still, William L., to Ensco, Inc. Synthetic pulse radar including a microprocessor based controller. 4,218,678, Cl. 343-5.0FT.

Fox, Robert E., to Deere & Company. Depth control and seed boot assembly for tillage apparatus. 4,217,835, Cl. 111-85.000.

Fox, Robert J.: *See—*
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., 4,218,690, Cl. 340-149.00R.

Franchi, Giuliano: *See—*
Penco, Sergio; Franchi, Giuliano; and Arcamone, Federico, 4,218,440, Cl. 424-180.000.

Franetzki, Manfred, to Siemens Aktiengesellschaft. Apparatus for supplying medication to the human or animal body. 4,217,894, Cl. 128-213.00R.

Frank, Steven N., to Texas Instruments Incorporated. Configuration for a gas redox fuel cell employing an ion exchange membrane. 4,218,519, Cl. 429-15.000.

Franz, John E.; and Kaufman, Robert J., to Monsanto Company. Ester derivatives of n-trifluoroacetyl-n-phosphonomethylglycine and the herbicidal use thereof. 4,218,235, Cl. 71-86.000.

Fraser, Alexander G., to Bell Telephone Laboratories, Incorporated. Control circuit for modifying contents of packet switch random access memory. 4,218,756, Cl. 364-900.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Freund, Eckhard, 4,218,172, Cl. 414-730.000.

Freese, Gary P.; and Olthoff, James A., to Caterpillar Tractor Co. Bulldozer blade angle slide mechanism. 4,217,963, Cl. 172-804.000.

Frei, Max, to Schenker Maschinen AG. Grinding machine. 4,217,734, Cl. 51-118.000.

Freier, Lutz. Colonic endoprosthesis. 4,217,899, Cl. 128-283.000.

Frese, Albert, to Chemische Werke Huls Aktiengesellschaft. Process for the production of polybutene-1 formable into transparent films. 4,218,551, Cl. 526-158.000.

Freund, Eckhard, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Method of and arrangement for controlling manipulators and industrial robots. 4,218,172, Cl. 414-730.000.

Freund, Melvin A., to Babcock & Wilcox Company, The. Lance tube construction. 4,218,016, Cl. 239-186.000.

Frey, Robert E., to Donaldson Company, Inc. Dust collector. 4,218,227, Cl. 55-302.000.

Friedli, Hans R.: *See—*
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., 4,218,383, Cl. 260-346.750.

Fuchigami, Shuzo; and Miyashiro, Toshio, to Fuji Photo Film Co., Ltd. Process for producing photographic material. 4,218,533, Cl. 430-512.000.

Fuchs, Alfred; and Andersson, Erik T., to Tetra Pak International AB. Method and an arrangement for the cleaning of a filler pipe in a packing machine. 4,218,265, Cl. 134-18.000.

Fuchs, Rainer; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 3-phenoxy-fluoro-benzyl carboxylic acid esters. 4,218,469, Cl. 424-304.000.

Fuji Photo Film Co., Ltd.: *See—*
Fuchigami, Shuzo; and Miyashiro, Toshio, 4,218,533, Cl. 430-512.000.
Honjo, Satoru; Sawada, Kenichi; and Fukagawa, Masaki, 4,218,362, Cl. 260-40.00R.
Mizutani, Shigemitsu, 4,217,744, Cl. 53-55.000.

Fuji Xerox Co., Ltd.: *See—*
Pu, Lyong S.; and Kamoda, Hitoshi, 4,218,529, Cl. 430-78.000.

Fujii, Ryosuke: *See—*
Sakamoto, Shigeru; Moriyama, Hiroyuki; Fujii, Ryosuke; Ishii, Toshiharu; Sugawara, Isao; and Kikuchi, Minoru, 4,217,762, Cl. 62-132.000.

Fujii, Tadashi, to Ricoh Company, Ltd. Recording apparatus with improved counter electrode. 4,218,691, Cl. 346-153.000.

Fujii, Toshiyuki; Mihara, Kiyohiko; Hokuyo, Shigeru; and Ishibashi, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing semiconductor devices. 4,217,689, Cl. 29-583.000.

Fujikawa, Kanichi: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Kimura, Fumio; Nasu, Rikuo; Sakashita, Nobuyuki; and Nishimura, Shigeyuki, 4,218,237, Cl. 71-94.000.

Fujisaki, Hisashi, to Nippon Electric Company, Ltd. Band-pass filter. 4,218,665, Cl. 333-165.000.

Fujisawa Pharmaceutical Company, Limited: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,218,374, Cl. 260-245.20R.

Fujita, Hisanori: *See*—
Hasegawa, Shinichi; and Fujita, Hisanori, 4,218,270, Cl. 148-175.000.

Fujitsu Limited: *See*—
Miura, Kenichi, 4,218,747, Cl. 364-716.000.

Fukagawa, Masaki: *See*—
Honjo, Satoru; Sawada, Kenichi; and Fukagawa, Masaki, 4,218,362, Cl. 260-40.00R.

Fukasawa, Noburu; and Ishikawa, Masao, to Nissan Motor Company, Limited. Indicator gauge with illuminated pointer. 4,218,726, Cl. 362-23.000.

Fukuda, Hiroshi; and Shimoda, Minoru, to Matsu Kyu Kabushiki Kaisha. Electromagnetic relay. 4,218,626, Cl. 307-116.000.

Fukuyama, Toshihiko; and Yanagisawa, Shintaro, to Vlsi Technology Research Association. Process for forming metal and metal silicide films. 4,218,291, Cl. 204-1.00T.

Furegati, Marcel, to Hydaira-Coreal AG. Stock-feeding apparatus. 4,217,800, Cl. 82-2.500.

Furka, Arpad: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel, Jolan, nee Szepespataki, 4,218,404, Cl. 260-944.000.

Furugard, Erik: *See*—
Brosow, Jorgen; and Furugard, Erik, 4,218,674, Cl. 340-149.00A.

Furuta, Yukio; and Okumura, Tomisaburo, to Matsushita Electric Industrial Co., Ltd. Non-volatile memory refresh control circuit. 4,218,764, Cl. 365-222.000.

Futaba Denshi Kogyo K.K.: *See*—
Miyazawa, Hisashi, 4,218,636, Cl. 315-169.100.
Takagi, Toshinori, 4,217,855, Cl. 118-719.000.
Takagi, Toshinori; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,218,495, Cl. 427-42.000.

G. B. Boucherie, naamloze rennootschap, Firma: *See*—
Boucherie, Leonel P., 4,218,096, Cl. 300-3.000.

G. D. Searle & Co.: *See*—
Hackett, William C., 4,218,233, Cl. 71-9.000.

G.L.S. Partnership: *See*—
Cooper, Gary D.; and Brigman, Ronald D., 4,218,063, Cl. 273-237.000.

GAF Corporation: *See*—
Lorenz, Donald H.; and Gruber, Bruce A., 4,218,392, Cl. 260-465.00D.

Gala Industries, Inc.: *See*—
McCracken, David A., 4,218,323, Cl. 210-415.000.

Galetto, Louis V.: *See*—
Arnold, Robert W.; and Galetto, Louis V., 4,218,641, Cl. 318-341.000.

Galjuk, Vasily K.: *See*—
Ikhsanov, Deviz F.; Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; and Galjuk, Vasily K., 4,218,044, Cl. 254-93.00R.

Galvez, Buenaventura B.: *See*—
Chase, John D.; Galvez, Buenaventura B.; and Kennedy, Bruce W., 4,218,569, Cl. 568-697.000.

Galvin, Richard S.: *See*—
Teager, Robert S.; and Galvin, Richard S., 4,218,186, Cl. 416-95.000.

Ganellin, Charon R.: *See*—
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,218,452, Cl. 424-251.000.

Gannon, Charles R.; and Sawran, William R., to Ashland Oil, Inc. Extrusion oil composition for carbon electrode manufacture. 4,218,305, Cl. 208-14.000.

Garcia, Frank P. Porous surface sealing compound. 4,218,259, Cl. 106-98.000.

Gardner, Denise: *See*—
Schoenfield, Palmer J.; Gardner, Denise; and Morrison, Howard J., 4,217,724, Cl. 46-22.000.

Garn, Larry W., to Steelcase Inc. Polymer spring. 4,218,599, Cl. 200-159.00R.

Garneau, Norman M., Sr. Mold for comb. 4,218,038, Cl. 249-160.000.

Garnier, Michael F., to International Business Machines Corporation. Magnetic head slider assembly. 4,218,715, Cl. 360-103.000.

Garrett, William R., to Smith International, Inc. Junk basket, bit and reamer stabilizer. 4,217,966, Cl. 175-308.000.

Gartner, Stanley: *See*—
Ache, Richard P.; Gartner, Stanley; and Nissen, Alexandre, 4,217,937, Cl. 140-92.100.

Gast, Lyle E.: *See*—
Schwab, Arthur W.; Gast, Lyle E.; and Kenney, Harold E., 4,218,332, Cl. 252-48.600.

Gates, H. Gordon, to Gates & Sons, Inc. Concrete form tie. 4,218,039, Cl. 249-214.000.

Gates & Sons, Inc.: *See*—
Gates, H. Gordon, 4,218,039, Cl. 249-214.000.

Gattu, Narahari; and Johnson, Paul E., to Harnischfeger Corporation. Actuator for telescopic boom. 4,217,987, Cl. 212-144.000.

Gawne, Gordon S. Fluid propulsion apparatus. 4,218,176, Cl. 415-90.000.

Gay, Derek J.: *See*—
Flicker, Alcwyn; Gay, Derek J.; Rhodes, Tony; and Sweet, Roger H., 4,217,726, Cl. 46-120.000.

Gebr. Eicher G.m.b.H.: *See*—
Boehm, Ernst; and Eder, Heinz, 4,218,022, Cl. 241-101.700.

Geddie, Joseph D., to M.H.G., Inc. Pet relief station. 4,217,857, Cl. 119-1.000.

Gee, James W. Heater. 4,217,876, Cl. 126-99.00R.

Gee, Lawrence F.; Jarvis, Denis B.; and Aldhous, Christopher J., to U.S. Philips Corporation. Integrated logic circuit having interconnections of various lengths between field effect transistors of enhancement and depletion modes. 4,218,693, Cl. 357-41.000.

General Battery Corporation: *See*—
DiGiacomo, Hector L.; and Sacco, John A., 4,218,526, Cl. 429-138.000.

General Cable Corporation: *See*—
Bahder, George; and Thompson, Paul F., 4,218,577, Cl. 174-23.00C.

General Electric Company: *See*—
Barrett, Eugene R.; and Arnold, Richard B., 4,217,938, Cl. 140-92.100.
Bedard, James F.; and Hughes, William C., 4,218,635, Cl. 315-17.000.
Brisken, Axel F.; and Smith, Lowell S., 4,217,684, Cl. 29-25.350.
Chambers, George S.; and Sinclair, Carter, 4,218,728, Cl. 363-54.000.
Chambers, George S., 4,218,729, Cl. 363-54.000.
Cooper, Glenn D.; and Abolins, Visvaldis, 4,218,364, Cl. 260-45.70P.
Humphrey, James S., Jr., 4,218,508, Cl. 428-331.000.
Lafuze, David L., 4,218,732, Cl. 363-160.000.
Mark, Victor; and Wilson, Phillip S., 4,218,357, Cl. 260-30.80R.
Narbus, Joseph J., 4,218,716, Cl. 361-37.000.
Papadofrangakis, Emmanuel; and Engeler, William E., 4,217,909, Cl. 128-663.000.
Pauze, Denis R., 4,218,550, Cl. 525-437.000.
Robillard, Robert J., 4,217,995, Cl. 222-327.000.
Schilling, William F.; and Beltran, Adrian M., 4,218,007, Cl. 228-194.000.
Stetson, Earl W., 4,218,721, Cl. 361-117.000.
Tsai, Reysen, 4,218,719, Cl. 361-82.000.
Vakil, Himanshu B.; and Flock, John W., 4,217,760, Cl. 62-114.000.
Yang, Kei-Hsiung; and Gruenke, Lothar A., 4,218,619, Cl. 250-315.200.

General Foods Corporation: *See*—
Lee, Jean; Shaw, Janice R.; Giuliano, Carmine; and Butera, Ned, 4,218,485, Cl. 426-296.000.

General Motors Corporation: *See*—
Abu-Akeel, Abdulhadi K.; Barrowman, Thomas; and Rieck, Gerald C., 4,218,166, Cl. 414-1.000.
Baldwin, Jack W.; and Carlson, Jonathon D., 4,218,019, Cl. 239-290.000.
Bradley, Arthur W., 4,217,813, Cl. 91-375.00A.
Byrne, James P., 4,217,812, Cl. 91-375.00A.
Compeau, Edward E., 4,218,076, Cl. 280-804.000.
Crawford, Ray V., 4,218,074, Cl. 280-801.000.
Cymbal, William D., 4,218,073, Cl. 280-731.000.
Dzioba, Donald L.; and Eckhardt, Dennis C., 4,217,811, Cl. 91-375.00A.
Finn, Bernard J.; Steger, Charles B.; and Reid, Kenneth H., 4,218,033, Cl. 242-107.40A.
Irwin, John A., 4,218,178, Cl. 415-114.000.
Kesling, Keith, 4,217,792, Cl. 74-484.00R.
Kneusels, Max B., 4,218,109, Cl. 339-147.00R.
Koliba, Melvin J.; Oakes, Clarence D., Jr.; and Napel, Larry P., 4,217,831, Cl. 410-121.000.
Madsen, Wayne A.; Kibler, Roland G.; and Ely, Jeffrey A., 4,217,867, Cl. 123-350.000.
Palma, James D., 4,218,021, Cl. 239-585.000.
Reider, Samuel B., 4,218,020, Cl. 239-406.000.
Riddel, John W., 4,217,969, Cl. 180-175.000.
Rogers, Lloyd W., Jr., 4,218,075, Cl. 280-804.000.
Swindlehurst, Carl P.; and Navarro, Sam J., 4,218,088, Cl. 296-137.00R.
Van Gorder, Jack H., 4,217,926, Cl. 137-389.000.
Williams, James R., 4,217,755, Cl. 60-39.750.

General Thermal Corporation: *See*—
McLaughlin, Jay C., 4,217,886, Cl. 126-446.000.

George Neville Truck Equipment Limited: *See*—
Neville, George E., 4,218,087, Cl. 296-100.000.

George, Robert W., to National Can Corporation. Tamper-proof closure. 4,217,989, Cl. 215-253.000.

Georgetown Texas Steel Corp.: *See*—
Vanecek, Michael J.; Piepenhagen, John H. K.; Neale, Michael J.; Lasiter, Steven M.; and Bailey, Raymond A., 4,218,048, Cl. 266-236.000.

Gertz, Herman F. Massage ottoman. 4,218,093, Cl. 297-439.000.

Gianfranco, Roman, to Claber S.p.A. Oscillable sprinkler for cultivated plots, such as fields, meadows, gardens and the like. 4,218,017, Cl. 239-242.000.

Giannaula, Joseph J.; and Reever, Kenneth P., to United States of America, Navy. Connector-to-connector adaptor. 4,218,110, Cl. 339-154.00A.
Gidner, Robert R., to Zurn Industries, Inc. Back flow preventer valve. 4,217,921, Cl. 137-218.000.
Gilchrist, Allan E., to SCM Corporation. Process for electrocoating aqueous dispersions of cathodic resins. 4,218,296, Cl. 204-181.00C.
Gillette Company, The: *See*—
Tuckerman, Edward M., 4,217,797, Cl. 76-101.00A.
Gingerich, Richard G. W.; and McClintic, Robert P., to GTE Products Corporation. Method for producing cobaltic hexammine compounds and cobalt metal powder. 4,218,240, Cl. 75-0.5AA.
Giuliano, Carmine: *See*—
Lee, Jean; Shaw, Janice R.; Giuliano, Carmine; and Butera, Ned, 4,218,485, Cl. 426-296.000.
Givaudan Corporation: *See*—
Jaeggi, Kurt, 4,218,487, Cl. 426-533.000.
GK Haninge Maskiner AB: *See*—
Karlsson, Gustav, 4,217,707, Cl. 37-41.000.
Glass, Howard L.: *See*—
Reekstin, John P.; and Glass, Howard L., 4,218,503, Cl. 428-195.000.
Gleason, John G., to SmithKline Corporation. 7β-Hydroxy-3-heterocyclicthio-methyl cephalosporin intermediates. 4,218,564, Cl. 544-26.000.
Gloggler, Martin. Device for laterally defining a cattle stall. 4,217,860, Cl. 119-27.000.
Godfroid, Jean-Jacques; and Steiner, Efroim, to Centre Europeen de Recherches Mauvernay. Derivatives of 4-cyclohexyl-1-naphthaleneacetic acid and their use as drugs. 4,218,473, Cl. 424-317.000.
Gokcen, Cem M., to Baxter Travenol Laboratories, Inc. Method for extruding a parison. 4,218,416, Cl. 264-167.000.
Goldberg, David B.; and Baker, J. W. Vest. 4,217,663, Cl. 2-102.000.
Golembeck, Gerald A.; and Wilwert, Eugene D., to United States Bedding Company, The. Zipper sewing attachment and method. 4,217,840, Cl. 112-265.200.
Goo, Gee-In: *See*—
Young, Charles, Jr.; and Goo, Gee-In, 4,217,826, Cl. 102-200.000.
Good, Lewis D. Material storage and feeding device. 4,217,996, Cl. 222-404.000.
Goodacre, Cecil, to Lansing Bagnall Limited. Front and side loading industrial lift truck. 4,218,170, Cl. 414-666.000.
Goodwin, R. Wendell, to Sangamo Weston, Inc. Apparatus and method for digitally obtaining signals having specified statistical distributions. 4,218,748, Cl. 364-717.000.
Goodwin, R. Wendell: *See*—
Babaud, Jean; and Goodwin, R. Wendell, 4,218,749, Cl. 364-717.000.
Goodyear Aerospace Corporation: *See*—
Olinger, Kenneth J.; and Boydelatour, Lester, 4,218,097, Cl. 301-5.00B.
Goodyear Tire & Rubber Company, The: *See*—
Alfio, Deregibus, 4,218,419, Cl. 264-334.000.
Gordon, Matthew. Meat deboning process. 4,217,679, Cl. 17-46.000.
Gosewinkel, Werner: *See*—
Eisenbach, Dieter; and Gosewinkel, Werner, 4,218,336, Cl. 252-411.00R.
Goss, Michael J.; and Exall, Douglas I., to Texaco Canada Inc. Method of in-situ recovery of viscous oils or bitumen utilizing a thermal recovery fluid and carbon dioxide. 4,217,956, Cl. 166-272.000.
Gotsmann, Ulrich: *See*—
Nagl, Gert; Ribka, Joachim; Dickmanns, Heinz; and Gotsmann, Ulrich, 4,218,219, Cl. 8-652.000.
Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See*—
Hegemann, Karl-Rudolf; and Weissert, Helmut, 4,218,241, Cl. 75-60.000.
Gould Inc.: *See*—
Bourke, Robert F.; and Johansen, David K., 4,218,644, Cl. 320-21.000.
Clausing, Challiss I., 4,218,596, Cl. 200-144.00R.
Gouldson, Eric J.: *See*—
Pound, Thomas C.; and Gouldson, Eric J., 4,218,580, Cl. 174-107.000.
Graham, Joseph; and Lodge, James R., deceased (by Lodge, Jean I., personal representative), to Minnesota Mining and Manufacturing Company. Intumescable fire-retardant products. 4,218,502, Cl. 428-144.000.
Graham Magnetics, Inc.: *See*—
Deffeyes, Robert J.; and Johnson, Grover L., 4,218,507, Cl. 428-328.000.
Grange, Edward W.; Henry, David W.; and Lee, William W., to SRI International. Glyoxylic acid hydrocarbylsulfonylhydrazones and therapeutic compositions. 4,218,465, Cl. 424-275.000.
Granger, Jim G., Jr. Grain storage bin and method of making and using the same. 4,217,739, Cl. 52-197.000.
Grantham, Daniel H., to United Technologies Corporation. Apparatus for producing HBr utilizing a consumable bromine electrode. 4,218,301, Cl. 204-251.000.
Grather, Gunter; Rabus, Friedrich; and Stuible, Ewald, to Robert Bosch GmbH. Ignition system for internal combustion engines, particularly of the automotive type. 4,217,868, Cl. 123-416.000.
Grather, Gunter: *See*—
Rabus, Friedrich; and Grather, Gunter, 4,217,872, Cl. 123-596.000.
Graves, George A.: *See*—
Bajpai, Praphulla K.; and Graves, George A., 4,218,255, Cl. 106-45.000.
Green, George E., to Ciba-Geigy Corporation. Bonding method employing film adhesives containing an epoxide resin. 4,218,279, Cl. 156-272.000.
Green, Maurice: *See*—
McCarthy, Charles J.; and Green, Maurice, 4,217,798, Cl. 81-3.200.
Green, Robert G.: *See*—
Bayman, Jack A.; and Green, Robert G., 4,218,099, Cl. 301-37.00R.
Greenberger, William, to Hopp Press Incorporated, The. Slidable window sign. 4,217,713, Cl. 40-488.000.
Grendelman, Mannes; Poiesz, Mattheus J.; and van der Kemp, Leo A. A., to Wavin B.V. Fiber reinforced plastic pipe part. 4,217,935, Cl. 138-109.000.
Gress, Bernd; and Deuringer, Rainer. Heated hair brush. 4,217,915, Cl. 132-9.000.
Griffin, Gerald J. L., to Coloroll Limited. Shaped synthetic polymers containing a biodegradable substance. 4,218,350, Cl. 260-17.4ST.
Griffith Laboratories, Limited, The: *See*—
Dyson, David V.; Darley, Kenneth S.; and Fenn, Michael A. F., 4,218,480, Cl. 426-19.000.
Grohoski, Raymond; and Mileos, George, to Timex Corporation. Releasable and adjustable end attachment for watchband and the like. 4,217,681, Cl. 24-265.0WS.
Gross, Benjamin; and Lee, Jong W., to Mobil Oil Corporation. Method for catalytic cracking heavy oils. 4,218,306, Cl. 208-120.000.
Gruber, Bruce A.: *See*—
Lorenz, Donald H.; and Gruber, Bruce A., 4,218,392, Cl. 260-465.00D.
Grudzinskas, Charles V.; and Weiss, Martin J., to American Cyanamid Company. Novel 11-deoxy-11-substituted prostaglandins of the E and F series. 4,218,565, Cl. 560-121.000.
Gruenke, Lothar A.: *See*—
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Gruzling, Josip, to Seaspan Development Co. Ltd. Barge dagger skegs. 4,217,844, Cl. 114-63.000.
Grzybowski, James P., to Ford Motor Company. Rectifying apparatus including six semiconductor diodes sandwiched between ceramic wafers. 4,218,694, Cl. 357-76.000.
GTE Products Corporation: *See*—
Ache, Richard P.; Gartner, Stanley; and Nissen, Alexandre, 4,217,937, Cl. 140-92.100.
Gingerich, Richard G. W.; and McClintic, Robert P., 4,218,240, Cl. 75-0.5AA.
Kam, George H.; and Lovely, John D., 4,218,720, Cl. 361-93.000.
Steinbergs, Arvey Z.; Taylor, Ray H.; and Whalen, James T., 4,218,592, Cl. 179-175.20D.
Guazzoni, Guido; and Herchakowski, Andrew, to United States of America, Army. Liquid hydrocarbon-fueled thermo-electric generator with counter-flow type regenerative heat exchanger. 4,218,266, Cl. 136-209.000.
Guillaume, Jacques: *See*—
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,218,375, Cl. 260-330.300.
Guinot, Gabriel L., to Societe Anonyme de Droit Francais, Poclain. Public works machine including control jacks in a boom balance assembly. 4,218,171, Cl. 414-694.000.
Gulf Canada Limited: *See*—
Chase, John D.; Galvez, Buenaventura B.; and Kennedy, Bruce W., 4,218,569, Cl. 568-697.000.
Gulf Oil Corporation: *See*—
Antonoplos, Patricia A.; Bertino, Clarence D.; and Heilman, William J., 4,218,555, Cl. 528-126.000.
Gulf Research & Development Company: *See*—
Bacha, John D.; and Hill, Robert W., 4,218,331, Cl. 252-48.600.
Gunjima, Tomoki: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; and Gunjima, Tomoki, 4,218,542, Cl. 521-27.000.
Gus Manufacturing, Inc.: *See*—
Joosten, Wesley L.; Mart, Carl F.; Miller, John W.; and Brown, Otice E., 4,218,767, Cl. 367-79.000.
Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See*—
Vincent, August, 4,217,954, Cl. 165-133.000.
Guthikonda, Ravindra N.: *See*—
Cama, Lovji D.; Christensen, Burton G.; and Guthikonda, Ravindra N., 4,218,459, Cl. 424-270.000.
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,218,463, Cl. 424-274.000.
Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Novel ester derivatives of polycarboxylic acids and process for making same. 4,218,381, Cl. 260-343.600.
GW-Sprinkler A/S: *See*—
Poulsen, Soren B., 4,217,959, Cl. 169-28.000.
Gyongyos, Ivan; and Bolliger, Martin, to Prolizenz AG. Process for the delivery of molten metal to a caterpillar type mold. 4,217,947, Cl. 164-87.000.
Haas, Frank J., to Burroughs Corporation. Voltage regulator with current limiting circuitry. 4,218,647, Cl. 323-9.000.
Hackett, William C., to G. D. Searle & Co. Method for deodorizing poultry houses. 4,218,233, Cl. 71-9.000.
Hackman, Donald J.: *See*—
Canty, Michael P.; Caudy, Don W.; Hackman, Donald J.; Harris, Jeremy M.; Mowery, Robert W.; Riley, George R.; and Trott, Beverly D., 4,217,717, Cl. 42-1.00R.

Haft, Theodore. Retractable wheel assembly for luggage. 4,217,675, Cl. 16-19.000.

Hagen, Helmut: *See—*
Fleig, Helmut; Hagen, Helmut; Dockner, Toni; and Kohlmann, Friedrich W., 4,218,460, Cl. 424-270.000.

Hagg, Per B.; Bergstrom, Sven; Lundmark, Lars E.; and Hedberg, Carl-Erik L., to Mo och Domsjo AB. Method for shredding and dry-defibrating compressed cellulose pulp and forming a batt of the resulting cellulosic fibrous material. 4,218,414, Cl. 264-40.400.

Hahn, Klaus; Walter, Manfred; Stange, Karl; and Weber, Heinz, to BASF Aktiengesellschaft. Self-extinguishing, expandable styrene polymers. 4,218,511, Cl. 428-407.000.

Haines, John W.: *See—*
Brinegar, Bill W.; and Haines, John W., 4,218,706, Cl. 358-172.000.

Haisma, Jan; and Van Mierloo, Klaas L. L., to U.S. Philips Corporation. Device for close-packed magnetic domains. 4,218,762, Cl. 365-32.000.

Hajek, James D.; and McReynolds, Earl E., to Upjohn Company, The. Distillation apparatus with a grid partial condenser. 4,218,289, Cl. 202-161.000.

Hajime Industries, Ltd.: *See—*
Yoshida, Hajime, 4,218,673, Cl. 340-146.3MA.

Halasa, Adel F.: *See—*
Hergenrother, William L.; and Halasa, Adel F., 4,218,556, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,218,557, Cl. 528-168.000.

Halliburton Company: *See—*
Kendrick, William D., 4,218,080, Cl. 285-347.000.
Watson, Jimmie L.; and Totten, Patsy L., 4,218,316, Cl. 210-51.000.

Halling, Horace P., to Pressure Science Incorporated. Multi-ply sealing rings. 4,218,067, Cl. 277-205.000.

Hallmark Cards, Incorporated: *See—*
Don Carlos, Alva G., 4,218,009, Cl. 229-39.00R.

Halmdienst, Franz: *See—*
Beltrami, Pier-Angelo; and Halmdienst, Franz, 4,218,089, Cl. 297-58.000.

Hamer, George D.: *See—*
Downing, Brian Y.; and Hamer, George D., 4,218,546, Cl. 525-170.000.

Hamm, Robert G.: *See—*
Brown, Larry L.; and Hamm, Robert G., 4,217,849, Cl. 116-212.000.

Hammann, Ingeborg: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,218,469, Cl. 424-304.000.

Hammele, Karl; and Schotten, Henno, to Bosch-Siemens Hausgerate GmbH. Asynchronous motor-driven machine having variable torque demand, such as household refrigerator compressors. 4,217,763, Cl. 62-227.000.

Hamza, Hassan A.; and Visman, Jan, to Canadian Patents & Development. Method of rapidly dissolving a particulate substance in a liquid. 4,218,012, Cl. 239-10.000.

Haneda, Yoshinobu: *See—*
Hiraoka, Suguru; Sakuraya, Yasuyuki; and Haneda, Yoshinobu, 4,218,228, Cl. 55-319.000.

Hannart, Jean A. A. J. N-Substituted hexahydro-6-canthinones for treating cardio-circulatory, cerebrovascular, and respiratory dysfunction. 4,218,453, Cl. 424-256.000.

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Joensson, Aake N.; Merenyi, Ferenc; Moses, Pinchas; Karlsson, Lennart E.; and Hanshoff, Gunnar, 4,218,476, Cl. 424-321.000.

Hansson, Hans. Method and a device for automatic cleaning of trash-racks at water intakes for water power plants and similar. 4,218,319, Cl. 210-159.000.

Hara, Shigeyoshi; and Omae, Iwao, to Teijin Limited. Photoconductive resin containing tertiary amino groups for electrophotography. 4,218,247, Cl. 430-78.000.

Harada, Hiroaki: *See—*
Watanabe, Koichi; Harada, Hiroaki; and Kotone, Akira, 4,218,432, Cl. 424-14.000.

Harada, Kiyoshi: *See—*
Tsunoda, Sachio; and Harada, Kiyoshi, 4,218,182, Cl. 415-205.000.

Harada, Seiki: *See—*
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, 4,218,283, Cl. 156-656.000.

Haraguchi, Hirofumi, to Takeda Riken Kogyo Kabushikikaisha. Effective value measuring apparatus. 4,218,736, Cl. 364-483.000.

Harford, Jack R., to RCA Corporation. Keyed AGC circuit. 4,218,708, Cl. 358-178.000.

Harnischfeger Corporation: *See—*
Gattu, Narahari; and Johnson, Paul E., 4,217,987, Cl. 212-144.000.

Harrell, Gary W.: *See—*
McPherson, William E.; and Rowe, David W., 4,218,184, Cl. 416-17.000.

Harris Corporation: *See—*
Monari, Lawrence M., 4,218,688, Cl. 346-74.100.

Harris, Eugene G.; and White, John F., to Emery Industries, Inc. Process for the production of macrocyclic esters. 4,218,379, Cl. 260-340.200.

Harris, Frederick J., to Olin Corporation. Baffled venting of gas from a powder actuated tool. 4,218,005, Cl. 227-10.000.

Harris, Jeremy M.: *See—*
Canty, Michael P.; Caudy, Don W.; Hackman, Donald J.; Harris, Jeremy M.; Mowery, Robert W.; Riley, George R.; and Trott, Beverly D., 4,217,717, Cl. 42-1.00R.

Harris, Stephen E., to Leland Stanford Junior University, The Board of Trustees of the. Vacuum ultraviolet and x-ray light source and method and short wavelength laser pumped by said light source. 4,218,628, Cl. 307-426.000.

Hartkorn, Karl H. Oxidation and adsorption method for removing contaminating substances from liquids. 4,218,315, Cl. 210-26.000.

Hartmann, Wilhelm U.; Augustine, Larry C.; and Ryan, Daniel J., to Textron, Inc. Filter element having removable filter media member. 4,218,324, Cl. 210-493.00R.

Hasegawa, Hiroshi, to Merit Abrasive Products, Inc. Abrasive flap drum. 4,217,737, Cl. 51-334.000.

Hasegawa, Shinichi; and Fujita, Hisanori, to Mitsubishi Monsanto Chemical Company. Method of fabricating electroluminescent element utilizing multi-stage epitaxial deposition and substrate removal techniques. 4,218,270, Cl. 148-175.000.

Hashimoto, Masashi: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,218,374, Cl. 260-245.20R.

Hashimoto, Yasuyuki, to Ancos Co., Ltd. Mechanical pencil. 4,218,153, Cl. 401-67.000.

Hassler, Dieter, to Siemens Aktiengesellschaft. Apparatus for ultrasonic scanning. 4,218,768, Cl. 367-105.000.

Haugwitz, Rudiger D.; and Maurer, Barbara V., to E. R. Squibb & Sons, Inc. Phenylene-bis (substituted thioureas). 4,218,396, Cl. 260-552.00R.

Hawker Siddeley Aviation Limited: *See—*
Jordan, William I. D., 4,218,035, Cl. 244-122.0AC.

Hayama, Nobuyuki: *See—*
Ito, Susumu; Nagao, Morimasa; Yamagata, Toshio; and Hayama, Nobuyuki, 4,217,783, Cl. 73-720.000.

Hayashi, Seizo; Tsutsumi, Shinya; and Kuroki, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Upright vacuum cleaner. 4,217,674, Cl. 15-361.000.

Hayati, Hossein; and Flasch, John R., to Stauffer Chemical Company. Binder composition and coating containing the same. 4,218,354, Cl. 260-29.20M.

Hayes, Fay A.; and Hayes, Leonard L. Inplace gasket belling machine. 4,218,208, Cl. 425-388.000.

Hayes, Leonard L.: *See—*
Hayes, Fay A.; and Hayes, Leonard L., 4,218,208, Cl. 425-388.000.

Hazen, Gretz L., to DEC International, Inc. Cheese making apparatus. 4,217,818, Cl. 99-456.000.

Heckles, John S. Acrylate-cyanoacetate-ureadiacetoacetamide-diacetoacetamide copolymers useful as protective surfaces. 4,218,515, Cl. 428-474.000.

Hedberg, Carl-Erik L.: *See—*
Hagg, Per B.; Bergstrom, Sven; Lundmark, Lars E.; and Hedberg, Carl-Erik L., 4,218,414, Cl. 264-40.400.

Heeres, Jan; and Mostmans, Joseph H., to Janssen Pharmaceutica, N.V. Heterocyclic derivatives of (4-aryloxy-methyl-1,3-dioxolan-2-yl)methyl-1H-imidazoles and 1H-1,2,4-triazoles. 4,218,458, Cl. 424-269.000.

Heffner, Ronald J.; and Lee, Russell. Emergency light. 4,218,725, Cl. 362-20.000.

Hegemann, Karl-Rudolf; and Weissert, Helmut, to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft. Method of recovering energy from converter exhaust gases. 4,218,241, Cl. 75-60.000.

Heidelberg, Gotz. System and vehicle to be held magnetically. 4,217,829, Cl. 104-148.0MS.

Heilman, William J.: *See—*
Antonoplos, Patricia A.; Bertino, Clarence D.; and Heilman, William J., 4,218,555, Cl. 528-126.000.

Heimerl, Joseph: *See—*
Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, 4,218,410, Cl. 264-8.000.

Heimlicher, Paul, to Maschinenfabrik Wifag. Folding apparatus for four or six etchings. 4,218,053, Cl. 270-71.000.

Hell, August: *See—*
Escales, Eberhard; Hell, August; Schubert, Andreas; and Weber, Klaus, 4,217,743, Cl. 53-54.000.

Hellma GmbH & Co. KG: *See—*
Mayer, Peter, 4,218,141, Cl. 356-246.000.

Hellman, Martin E.; and Merkle, Ralph C., to Leland Stanford Junior University, The Board of Trustees of the. Public key cryptographic apparatus and method. 4,218,582, Cl. 178-22.000.

Hemming, Leland H., to Plessey, Incorporated. Range focus lens. 4,218,683, Cl. 343-703.000.

Henault, Marc; and Vitter, Gerard, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electrochemical gauge for oxygen having an internal reference and solid electrolyte. 4,218,297, Cl. 204-195.00S.

Hendrie, Gardner C., to Data General Corporation. Microcode-controlled memory refresh apparatus for a data processing system. 4,218,753, Cl. 364-900.000.

Henke, Arthur W.: *See—*
Sargent, Charles L.; Hoffman, John A.; Antos, John M.; and Henke, Arthur W., 4,217,668, Cl. 4-321.000.

Henkel Corporation: *See—*
Lundmark, Larry D., 4,218,334, Cl. 252-356.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Hiller, Guenter, 4,218,437, Cl. 424-94.000.
Wiegner, Georg; Schwolow, Hartmut; Klein, Dieter; and Malaskiewicz, Juergen, 4,217,900, Cl. 128-285.000.

Henning, Herbert; and Kliemann, Siegfried, to Balcke-Durr Aktiengesellschaft. Cooling tower with ripple plates. 4,218,408, Cl. 261-112.000.

Henry, David W.: *See—*
Grange, Edward W.; Henry, David W.; and Lee, William W., 4,218,465, Cl. 424-275.000.

Hensel, Jorg: *See—*
Lakatos, Eduard; Koberstein, Edgar; Hensel, Jorg; and Bozon, Alfred, 4,218,341, Cl. 252-430.000.

Henton, David E., to Dow Chemical Company, The. Blends of polycarbonate with rubber and monovinylidene aromatic copolymers. 4,218,544, Cl. 525-67.000.

Henzel, Richard P.: *See—*
Hinshaw, Jerald C.; and Henzel, Richard P., 4,218,368, Cl. 260-156.000.

Hepworth, Edward C.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mensch, William D., Jr.; Peddle, Charles I.; Schriber, Gene A.; and Wiles, Michael F., 4,218,740, Cl. 364-200.000.

Herald, Robert F.; and Wilson, Melvin G., to International Business Machines Corporation. Braking system for loaded stepping motor. 4,218,643, Cl. 318-696.000.

Herchakowski, Andrew: *See—*
Guazzoni, Guido; and Herchakowski, Andrew, 4,218,266, Cl. 136-209.000.

Herchenbach, Horst; and Ramesohl, Hubert, to Klockner-Humboldt-Wedag AG. Method and apparatus for the thermal treatment of fine-grained material with hot gases. 4,218,209, Cl. 432-14.000.

Herchenbach, Horst, to Klockner-Humboldt-Deutz Aktiengesellschaft. System and method for the heat treatment of fine grained materials. 4,218,210, Cl. 432-106.000.

Hercsel, Jolan, nee Szepespataki: *See—*
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel, Jolan, nee Szepespataki, 4,218,404, Cl. 260-944.000.

Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene copolymers containing tetraalkyl orthosilicate substituents and a process therefore. 4,218,556, Cl. 528-168.000.

Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing N-substituted amido and imido substituents. 4,218,557, Cl. 528-168.000.

Hermann nee Szente, Ilona: *See—*
Solyom, Sandor; Toldy, Lajos; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,218,446, Cl. 424-241.000.

Herring, William T. Slotted floor section with built-in means adapted for heating litter in farrowing house. 4,217,859, Cl. 119-20.000.

Herrmann, Manfred: *See—*
Daubach, Ewald; Herrmann, Manfred; Oppenlaender, Knut; and Stork, Karl, 4,218,218, Cl. 8-550.000.

Hershberger, Welcome D. Weedless fishhook. 4,217,721, Cl. 43-43.200.

Hertzler, Bruce. Bullet sizing and lubricating system. 4,217,809, Cl. 86-19.000.

Hewes, Charles R.; and Mayer, Dale J., to Texas Instruments Incorporated. Charge-transfer programmable filter. 4,218,752, Cl. 364-825.000.

Heyer-Schulte Corporation: *See—*
Radovan, Chedomir; and Schulte, Rudolf R., 4,217,889, Cl. 128-1.00R.

Hida, Yoshikazu: *See—*
Shiga, Yasuhiro; and Hida, Yoshikazu, 4,218,505, Cl. 428-306.000.

Hikari, Kazuo. Load testing apparatus. 4,217,775, Cl. 73-135.000.

Hilbert, Francis H.: *See—*
Parker, Norman W.; and Hilbert, Francis H., 4,218,586, Cl. 179-1.0GS.

Hilbert, Robert A.; Kohl, William F., Jr.; Whelan, Joseph M.; and Apichella, John L. Adjustable system for mounting a basketball goal. 4,218,058, Cl. 273-1.50R.

Hill, Robert E., to Koppers Company, Inc. Water-repellent aqueous wood-treating solutions. 4,218,249, Cl. 106-2.000.

Hill, Robert W.: *See—*
Bacha, John D.; and Hill, Robert W., 4,218,331, Cl. 252-48.600.

Hiller, Guenter, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Animal feeds containing a mixture of virginiamycin, zinc bacitracin or flavophospholipol and proteolytic enzymes. 4,218,437, Cl. 424-94.000.

Hillier, Elizabeth Jean: *See—*
Hillier, Raymond G., 4,218,162, Cl. 408-188.000.

Hillier, Raymond G., to Hillier, Elizabeth Jean. Drilling bit. 4,218,162, Cl. 408-188.000.

Hills, Bruce W. Machine for twisting wire strands of electric cables. 4,217,750, Cl. 57-293.000.

Himmelheber, Jack L., Sr., to SCM Corporation. Collar around tank car dome area. 4,217,830, Cl. 105-360.000.

Hinshaw, Jerald C.; and Henzel, Richard P., to Eastman Kodak Company. Aromatic nitro compounds containing diffusible groups cleavable by intramolecular nucleophilic displacement. 4,218,368, Cl. 260-156.000.

Hiraishi, Hisashi; Morichika, Toshiaki; Murakami, Shinichi; and Akamatsu, Katsutaro, to Kubota Ltd. High corrosion resistant and high strength medium Cr and low Ni stainless cast steel. 4,218,268, Cl. 148-38.000.

Hiraoka, Suguru; Sakuraya, Yasuyuki; and Haneda, Yoshinobu, to Hoei Industry Co., Ltd. Exhaust gas purifying device. 4,218,228, Cl. 55-319.000.

Hirata, Goichi: *See—*
Samejima, Masayoshi; and Hirata, Goichi, 4,218,333, Cl. 252-316.000.

Hiroshi, Ootaki: *See—*
Kooichi, Yoshida; Eitoshi, Shozi; Hiroshi, Ootaki; and Takashi, Terada, 4,218,433, Cl. 424-15.000.

Hitachi Cable Ltd.: *See—*
Nagai, Masahiro; and Miyake, Yasuhiko, 4,217,852, Cl. 118-405.000.

Hitachi, Ltd.: *See—*
Arai, Takao, 4,218,659, Cl. 330-6.000.
Komatsu, Kazuhiro; Kamata, Kunio; and Kasai, Kenichi, 4,218,181, Cl. 415-189.000.
Komoriya, Susumu; Morita, Koyo; Nishizuka, Hiroshi; and Majima, Hisashi, 4,218,136, Cl. 355-79.000.
Marumoto, Katsuji; and Ohmae, Tsutomu, 4,218,730, Cl. 363-124.000.
Masaoka, Isao; and Imai, Katsuyuki, 4,218,604, Cl. 219-61.700.
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, 4,218,283, Cl. 156-656.000.
Tada, Naofumi; and Aihara, Katsuzo, 4,218,668, Cl. 335-216.000.
Watanabe, Takashi, 4,218,630, Cl. 310-260.000.

Hitachi Metals, Ltd.: *See—*
Kiyonaga, Kingo; Okuno, Toshio; and Tokuda, Kenji, 4,218,243, Cl. 75-124.000.

Hitchcock, Melvin L.; Ray, Ralph D.; and Felder, Eugene H., Jr., to SR Engineering. Adjustable short stroke solenoid. 4,218,669, Cl. 335-258.000.

Hoehn, Hans, to E. R. Squibb & Sons, Inc. 2,3-Dihydro-2-[(1H-imidazol-1-yl)-methylene]-1H-inden-1-ones. 4,218,461, Cl. 424-273.00R.

Hoei Industry Co., Ltd.: *See—*
Hiraoka, Suguru; Sakuraya, Yasuyuki; and Haneda, Yoshinobu, 4,218,228, Cl. 55-319.000.

Hoff, Raymond E.; and Pullukat, Thomas J., to Chemplex Company. Olefin polymerization catalyst of chromium and process of preparing it. 4,218,345, Cl. 252-458.000.

Hoffacker, Bernhard J.: *See—*
Hoffacker, Neal D.; and Hoffacker, Bernhard J., 4,218,090, Cl. 297-214.000.

Hoffacker, Neal D.; and Hoffacker, Bernhard J. Bicycle seat. 4,218,090, Cl. 297-214.000.

Hoffman, John A.: *See—*
Sargent, Charles L.; Hoffman, John A.; Antos, John M.; and Henke, Arthur W., 4,217,668, Cl. 4-321.000.

Hoffman, Louie E.; and Warne, Douglas M. Solar heat collector with interlocking expandable construction. 4,217,887, Cl. 126-448.000.

Hoffman, Roy L.; Mitchell, Glen R.; and Soltis, Frank G., to International Business Machines Corporation. Address translation apparatus. 4,218,743, Cl. 364-200.000.

Hoffman, Stephen A.; and Hummel, Jerry R., to Arcair Company. Air-carbon arc cutting and gouging torch. 4,218,605, Cl. 219-70.000.

Hoffmann-La Roche Inc.: *See—*
Comai, Karen; Sullivan, Ann; and Westley, John, 4,218,443, Cl. 424-181.000.
Maehr, Hubert, 4,218,560, Cl. 536-1.000.
Manchand, Percy S.; and Townsend, John M., 4,218,567, Cl. 562-475.000.

Hogan, Patrick M., to Brockway Glass Company, Inc. Method of glass strengthening by ion exchange. 4,218,230, Cl. 65-30.00E.

Hogan, Robert J.: *See—*
Walker, Darrell W.; Hogan, Robert J.; and Farha, Floyd, Jr., 4,218,343, Cl. 252-435.000.

Hogge, Charles R., Jr., to Rockwell International Corporation. Automatic clock positioning circuit for a digital data transmission system. 4,218,771, Cl. 375-120.000.

Hohenschutz, Heinz; Schmidt, Johannes E.; and Kiefer, Hans, to BASF Aktiengesellschaft. Preparation of formic acid. 4,218,568, Cl. 562-609.000.

Hokkaido University, The President of: *See—*
Kayukawa, Naoyuki; and Ozawa, Yasutomo, 4,218,629, Cl. 310-11.000.

Hokuyo, Shigeru: *See—*
Fujii, Toshiyuki; Mihara, Kiyohiko; Hokuyo, Shigeru; and Ishibashi, Yoshio, 4,217,689, Cl. 29-583.000.

Holata, Jan: *See—*
Sevcik, Stanislav; Trekoval, Jiri; Holata, Jan; and Stamberg, Jiri, 4,218,552, Cl. 526-173.000.

Holcomb, Orla L., Jr., to Bendix Corporation, The. Band brake assembly. 4,217,974, Cl. 188-77.00R.

Hollaway, Gerald C., Jr.; and Brooks, Alden W., to Dayco Corporation. Method for producing short fiber lengths from cord or fabric. 4,217,680, Cl. 19-0.460.

Holmes, Jerry D., to Eastman Kodak Company. Nickel and cobalt containing carbonylation catalyst compositions for the production of carboxylic acids and their esters. 4,218,340, Cl. 252-429.00R.

Honda, Munetaka; Tamou, Takuya; and Morimoto, Hisashi, to Showa Denko Kabushiki Kaisha. Method for preventing vapor explosion in a liquid comminuting process. 4,218,412, Cl. 264-11.000.

Honeywell Inc.: *See—*
Camier, Christian; and Manier, Francis, 4,218,031, Cl. 242-67.30R.
Mack, John C., Jr.; Peterson, Dean M.; and Honeywell Inc., 4,218,421, Cl. 422-66.000.

Honeywell Information Systems Inc.: *See—*
Negi, Virendra S.; and Miu, Ming T., 4,218,739, Cl. 364-200.000.

Honjo, Kazumi, to Niles Parts Co., Ltd. Composite switch device mounted to the steering shaft of automobiles. 4,218,595, Cl. 200-61.540.

Honjo, Satoru; Sawada, Kenichi; and Fukagawa, Masaki, to Fuji Photo Film Co., Ltd.; and Chugoku Marine Paints, Ltd. Powder marking agent and marking method. 4,218,362, Cl. 260-40.00R.
Hood, Frederick E.; and Empacher, K. Dietrich, to Little Harbor Boat Yard Corporation. Trailerable water ballasted sailboat. 4,217,845, Cl. 114-125.000.
Hooker Chemicals & Plastics Corp.: *See*—
Nawrot, Chester R., 4,218,293, Cl. 204-95.000.
Hopley, Eric T.: *See*—
Mills, Frederick; Hopley, Eric T.; Curtis, Raymond; and Wraighte, Patrick M., 4,217,988, Cl. 215-21.000.
Hopp Press Incorporated, The: *See*—
Greenberger, William, 4,217,713, Cl. 40-488.000.
Horak, Jerry R.; Dillon, Peter L. P.; and Firth, Ronald R., to Eastman Kodak Company. Apparatus for correcting time base error in a multichannel, sampled-analog video signal. 4,218,713, Cl. 360-36.000.
Hormann KG: *See*—
Hormann, Michael, 4,218,681, Cl. 455-603.000.
Hormann, Michael, to Hormann KG. Hand-held transmitter for transmitting different signals. 4,218,681, Cl. 455-603.000.
Horvath, Aniko: *See*—
Feuer, Laszlo; Furka, Arpad; Sebestyen, Ferenc; Horvath, Aniko; and Hercsel, Jolan, nee Szepespataki, 4,218,404, Cl. 260-944.000.
Howat, M. Ross: *See*—
Reed, Lloyd D.; Howat, M. Ross; and Ulrichsen, John E., 4,218,707, Cl. 358-113.000.
Howe, Milton A.: *See*—
Bieler, Anne C.; and Howe, Milton A., 4,218,486, Cl. 426-412.000.
Hrebec, Frank. Fly catcher. 4,217,723, Cl. 43-122.000.
Hsu, Li-Chen: *See*—
Philipp, Warren H.; May, Charles E.; Hsu, Li-Chen; and Sheibley, Dean W., 4,218,280, Cl. 156-272.000.
Hubmann, Max; Lang, Erich; and Menke, Franz, to Industrie-Automation GmbH & Co. Device for determination of the mechanical characteristic frequency of blood vessels, tendons, bones or similar organs in a body. 4,217,912, Cl. 128-774.000.
Hubscher Ribbon Corporation Ltd.: *See*—
Perron, Reginald F., 4,217,906, Cl. 128-510.000.
Hughes Aircraft Company: *See*—
Withrington, Roger J.; Cook, Lacy G.; and Jones, Helene H., 4,218,111, Cl. 350-3.720.
Hughes, William C.: *See*—
Bedard, James F.; and Hughes, William C., 4,218,635, Cl. 315-17.000.
Huin, Roland; and Barbier, Jean-Claude, to Institut Francais du Petrole. Process for recycling gaseous reactants used for regenerating a hydrocarbon hydroconversion catalyst. 4,218,338, Cl. 252-415.000.
Hultman, Bengt G.; and Nilsson, Rolf C., to Mo och Domsjo Aktiebolag. Process for the inhibition of the formation of deposits in cellulose pulping and cellulose pulp treating processes. 4,218,284, Cl. 162-38.000.
Humme, Gert: *See*—
Serini, Volker; Beck, Manfred; Morbitzer, Leo; Humme, Gert; and Schnetger, Jochen, 4,218,545, Cl. 525-92.000.
Hummel, Jerry R.: *See*—
Hoffman, Stephen A.; and Hummel, Jerry R., 4,218,605, Cl. 219-70.000.
Humphrey, James S., Jr., to General Electric Company. Polycarbonate articles coated with an adherent, durable silica filled organopolysiloxane coating and process for producing same. 4,218,508, Cl. 428-331.000.
Hydaira-Coreal AG: *See*—
Furegati, Marcel, 4,217,800, Cl. 82-2.500.
Ichihashi, Hiroo: *See*—
Shinohara, Yukimasa; and Ichihashi, Hiroo, 4,218,499, Cl. 427-444.000.
Idemitsu Kosan Company Limited: *See*—
Etoh, Yuichi; Kitayama, Akira; Kobayashi, Sadami; and Okazaki, Shigeyoshi, 4,218,428, Cl. 423-242.000.
Iida, Kosaku: *See*—
Kojima, Sadao, 4,218,322, Cl. 210-391.000.
Iida, Takashi: *See*—
Kawamura, Kunio; Yasukuni, Mitsuo; Iida, Takashi; and Suzuki, Yuziro, 4,218,120, Cl. 354-227.000.
Iizuka, Haruhiko: *See*—
Sugasawa, Fukashi; Marumo, Nagayuki; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,217,795, Cl. 74-858.000.
Ikeda, Akira: *See*—
Akaba, Hayao; Ikeda, Akira; and Lee, Masayoshi, 4,217,736, Cl. 51-284.00E.
Ikezaki, Muneyoshi; Otsuka, Hisao; Iwai, Hajime; Inamasu, Masanori; and Morita, Takashi, to Tanabe Seiyaku Co., Ltd. Novel benzylalcohols and pharmaceutical compositions and use thereof. 4,218,479, Cl. 424-330.000.
Ikhsanov, Deviz F.; Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; and Galjuk, Vasily K. Pipeline lifting device. 4,218,044, Cl. 254-93.00R.
Illinois Tool Works Inc.: *See*—
Klygis, Mindaugas J., 4,218,086, Cl. 294-87.200.
Imai, Katsuyuki: *See*—
Masaoka, Isao; and Imai, Katsuyuki, 4,218,604, Cl. 219-61.700.
Imamura, Eigo, to Sanyo Electric Co., Ltd. Superheterodyne receiver of scanning type with indicator means to display received frequency and frequency being stored in memory. 4,218,773, Cl. 455-159.000.
Imamura, Yoichi, to Kabushiki Kaisha Suwa Seikosha. C-MOS crystal oscillator including circuit for temporarily increasing closed loop gain. 4,218,661, Cl. 331-116.0FE.
Imperial Chemical Industries Limited: *See*—
Cohen, David L., 4,218,498, Cl. 427-336.000.
Edgar, Owen B.; and Yates, Michael R., 4,218,509, Cl. 528-339.000.
Rolla, Gunnar; and Winter, Michael R. C., 4,218,434, Cl. 424-49.000.
Inaba, Masao; and Sugimoto, Atsumi, to Nippon Electric Company, Ltd. Delay compensator for a television signal. 4,218,705, Cl. 358-149.000.
Inamasu, Masanori: *See*—
Ikezaki, Muneyoshi; Otsuka, Hisao; Iwai, Hajime; Inamasu, Masanori; and Morita, Takashi, 4,218,479, Cl. 424-330.000.
Industrie-Automation GmbH & Co.: *See*—
Hubmann, Max; Lang, Erich; and Menke, Franz, 4,217,912, Cl. 128-774.000.
Ingen Housz, Jan F. Apparatus for melting a thermoplastic material. 4,218,146, Cl. 366-78.000.
Inpro, Inc.: *See*—
Church, Brooks D., 4,218,538, Cl. 435-101.000.
Institut Francais du Petrole: *See*—
Huin, Roland; and Barbier, Jean-Claude, 4,218,338, Cl. 252-415.000.
Institut fur Privatwirtschaft Gschwend & Stadler: *See*—
Metzler, Heinrich, 4,218,260, Cl. 106-98.000.
Institut Pasteur: *See*—
Buissiere, Jean, 4,218,537, Cl. 435-34.000.
International Business Machines Corporation: *See*—
Allen, Francis K.; and Chin, Victor H., 4,218,758, Cl. 364-900.000.
Arnold, Robert W.; and Galetto, Louis V., 4,218,641, Cl. 318-341.000.
Carlton, James E.; and Schaeuble, Werner J., 4,218,742, Cl. 364-200.000.
Carlton, James E.; and Schaeuble, Werner J., 4,218,759, Cl. 364-900.000.
Dixon, Jerry D.; and Leininger, Joel C., 4,218,741, Cl. 364-200.000.
Garnier, Michael F., 4,218,715, Cl. 360-103.000.
Herald, Robert F.; and Wilson, Melvin G., 4,218,643, Cl. 318-696.000.
Hoffman, Roy L.; Mitchell, Glen R.; and Soltis, Frank G., 4,218,743, Cl. 364-200.000.
Matyas, Stephen M.; and Meyer, Carl H. W., 4,218,738, Cl. 364-200.000.
McManigal, David F., 4,218,751, Cl. 364-784.000.
Uberbacher, Edward C., 4,218,113, Cl. 350-96.210.
International Components Corporation: *See*—
Shure, Alan, 4,218,195, Cl. 417-411.000.
International Harvester Company: *See*—
Cicci, George B.; Markert, Leo A.; Ridge, George W.; and Lutz, Austin W., Jr., 4,217,746, Cl. 56-14.400.
International Paper Company: *See*—
Nowacki, Ulrich G., 4,217,815, Cl. 93-37.00R.
International Standard Electric Corporation: *See*—
Bohm, Manfred; and Peuker, Gunther, 4,218,679, Cl. 343-6.50R.
International Telephone and Telegraph Corporation: *See*—
Bayman, Jack A.; and Green, Robert G., 4,218,099, Cl. 301-37.00R.
Iodter, Polkhard: *See*—
Paulsen, Hans; Stadler, Peter; and Iodter, Polkhard, 4,218,561, Cl. 536-17.00R.
Ipri, Alfred C., to RCA Corporation. Fabrication of an integrated injection logic device incorporating an MOS/bipolar current injector. 4,217,688, Cl. 29-571.000.
Irwin, John A., to General Motors Corporation. Turbine vane structure. 4,218,178, Cl. 415-114.000.
Isaac, Otto; Posselt, Klaus; Uthemann, Horst; and Thiemer, Klaus, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Acyl derivatives of hellebrigenin. 4,218,447, Cl. 424-241.000.
Ishibashi, Yoshio: *See*—
Fujii, Toshiyuki; Mihara, Kiyohiko; Hokuyo, Shigeru; and Ishibashi, Yoshio, 4,217,689, Cl. 29-583.000.
Ishida, Kimikazu; and Ishida, Tsuneo. Gardening shears. 4,217,692, Cl. 30-128.000.
Ishida, Tsuneo: *See*—
Ishida, Kimikazu; and Ishida, Tsuneo, 4,217,692, Cl. 30-128.000.
Ishihara Sangyo Kaisha Limited: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Kimura, Fumio; Nasu, Riku; Sakashita, Nobuyuki; and Nishimura, Shigeyuki, 4,218,237, Cl. 71-94.000.
Ishii, Toshiharu: *See*—
Sakamoto, Shigeru; Moriyama, Hiroyuki; Fujii, Ryosuke; Ishii, Toshiharu; Sugawara, Isao; and Kikuchi, Minoru, 4,217,762, Cl. 62-132.000.
Ishikawa, Masao: *See*—
Fukasawa, Noburu; and Ishikawa, Masao, 4,218,726, Cl. 362-23.000.
Ishimoto, Osamu; Nishikawa, Masaji; and Yamazaki, Masaru, to Olympus Optical Co., Ltd. Electrophotographic apparatus. 4,218,129, Cl. 355-14.0SH.
Ishimoto, Osamu: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, 4,218,135, Cl. 355-72.000.
Ishitobi, Mamoru: *See*—
Yanagihara, Nobuyuki; Matsumoto, Isao; Ishitobi, Mamoru; and Iwaki, Tsutomu, 4,217,939, Cl. 141-1.100.

Ismann, Ernst: *See*—
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.

Isozaki, Shin; and Sakurai, Kanji, to Mitsubishi Denki Kabushiki Kaisha. Double side type flexible magnetic disc drive apparatus. 4,218,714, Cl. 360-99.000.

Ito, Masayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Process quantity display apparatus. 4,218,734, Cl. 364-118.000.

Ito, Susumu; Nagao, Morimasa; Yamagata, Toshio; and Hayama, Nobuyuki, to Nippon Electric Company, Ltd. Magnetoresistive pressure-sensing device for automotive electronic engine control systems. 4,217,783, Cl. 73-720.000.

Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, to Canon Kabushiki Kaisha. Cleaning device. 4,218,131, Cl. 355-15.000.

Itoh, Takuji; and Akitsuki, Ikuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Hydrogenation catalyst. 4,218,308, Cl. 208-143.000.

ITT Industries, Inc.: *See*—
Bernat, Georg, 4,218,041, Cl. 251-127.000.

Ivy, Leon H. Apparatus for detecting longitudinal and transverse imperfections in elongated ferrous workpieces. 4,218,651, Cl. 324-227.000.

Iwahashi, Haruo: *See*—
Shinozaki, Sohji; Takei, Yoshiaki; and Iwahashi, Haruo, 4,218,124, Cl. 355-3.0SC.

Iwai, Fumio; Kokiso, Masakazu; Koiso, Junichi; and Ogino, Tamio, to Konishiroku Photo Industry Co., Ltd. Drum cleaning apparatus for electrophotographic copying machine. 4,218,132, Cl. 355-15.000.

Iwai, Hajime: *See*—
Ikezaki, Muneyoshi; Otsuka, Hisao; Iwai, Hajime; Inamasu, Masanori; and Morita, Takashi, 4,218,479, Cl. 424-330.000.

Iwai, Shizuo: *See*—
Takeuchi, Koji; Zama, Takashi; and Iwai, Shizuo, 4,218,261, Cl. 106-111.000.

Iwaki, Tsutomu: *See*—
Yanagihara, Nobuyuki; Matsumoto, Isao; Ishitobi, Mamoru; and Iwaki, Tsutomu, 4,217,939, Cl. 141-1.100.

Iwamoto, Yasuhiko: *See*—
Morita, Yasuyuki; and Iwamoto, Yasuhiko, 4,218,200, Cl. 418-84.000.

Iwasaki, Sadayoshi; and Kumagaya, Masao, to Alps Electric Co., Ltd. Switch-latching mechanism. 4,218,598, Cl. 200-153.00J.

Iwasawa, Tadashi. Phonograph cartridge with very hard metal ceramic frame. 4,218,591, Cl. 179-100.41R.

J. T. Baker Chemical Co.: *See*—
Baxter, Robert, Jr.; Antoci, Frank J.; Tynes, William J., III; Petrucci, Pasquale M.; and Martin, George F., 4,218,610, Cl. 235-92.0PC.

Jackson, Robert G.; and Tillman, Richard M., to Conoco, Inc. Process for making methanol. 4,218,389, Cl. 260-449.500.

Jacob, Richard J.; and Wolk, Reuben, to Dayco Corporation. Hose curing method. 4,218,420, Cl. 264-570.000.

Jacobson, Richard N.: *See*—
Phillips, John R.; and Jacobson, Richard N., 4,218,290, Cl. 203-11.000.

Jacquemart, Patrick, to Societe Anonyme dite: les Cables de Lyon. Method and a device for repairing insulated cable which has been damaged or joined. 4,218,417, Cl. 264-275.000.

Jacquet, Bernard; and Lang, Gerard, to L'Oreal. Quaternized polymer for use as a cosmetic agent in cosmetic compositions for the hair and skin. 4,217,914, Cl. 132-7.000.

Jadamus, Hans; Mumcu, Salih; Burzin, Klaus; Feldmann, Rainer; and Feinauer, Roland, to Chemische Werke Huls Aktiengesellschaft. Thermoplastic molding compositions having improved flexibility and cold impact strength based upon polyamides from omega-aminocarboxylic acids and/or lactams having at least 10 carbon atoms. 4,218,549, Cl. 525-420.000.

Jaeggi, Kurt, to Givaudan Corporation. Processes for preparing flavoring compositions. 4,218,487, Cl. 426-533.000.

Jaekel, Gunter. Adjustable check valve. 4,217,931, Cl. 137-606.000.

Janssen Pharmaceutica, N.V.: *See*—
Heeres, Jan; and Mostmans, Joseph H., 4,218,458, Cl. 424-269.000.

Jaromin, Zygmunt; Szymczyk, Boleslaw; Blazewicz, Andrzej; and Pilarski, Klemens, to Centrainy Osrodek Projektowo-Konstrukoyjny Maszyn Gorniczych "KOMAG". Mining unit of coal combines. 4,218,095, Cl. 299-87.000.

Jarvis, Denis B.: *See*—
Gee, Lawrence F.; Jarvis, Denis B.; and Aldhous, Christopher J., 4,218,693, Cl. 357-41.000.

Jaschinski, Claus-Dieter: *See*—
Plewa, Manfred; Jaschinski, Claus-Dieter; and Meier, Dieter, 4,218,003, Cl. 226-104.000.

Jeffers, Thomas K.: *See*—
Callender, Maurice E.; and Jeffers, Thomas K., 4,218,438, Cl. 424-115.000.

Jeffreys, Dennis C.: *See*—
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,218,655, Cl. 455-39.000.

Jennings, Mansel A.: *See*—
Young, William O., Jr.; and Jennings, Mansel A., 4,217,682, Cl. 26-98.000.

Jericho, Karl: *See*—
Floymayr, Joachim; Jericho, Karl; Drechsel, Dietrich; and Bubeck, Friedrich, 4,218,424, Cl. 422-249.000.

Jess, Thurman S.; and Shim, Norm, to Baxter Travenol Laboratories, Inc. Flow metering apparatus for a fluid infusion system. 4,217,993, Cl. 222-14.000.

Joensson, Aake N.; Kempe, Tomas G.; Mikiver, Lembit; and Sparf, Bengt A., to AB Kabi. Geminally disubstituted indene derivatives. 4,218,472, Cl. 424-316.000.

Joensson, Aake N.; Merenyi, Ferenc; Moses, Pinchas; Karlsson, Lennart E.; and Hanshoff, Gunnar, to AB Kabi. Anti-thrombotic N-alkylthioakylamino benzenesulfonamides. 4,218,476, Cl. 424-321.000.

Johansen, David K.: *See*—
Bourke, Robert F.; and Johansen, David K., 4,218,644, Cl. 320-21.000.

Johns, Christopher; and Le Deit, Gerard, to Societe Anonyme D.B.A. Wear indicating device for a friction brake. 4,217,973, Cl. 188-1.00A.

Johnson, Gilbert A., to Marquette Electronics, Inc. Stepper motor rate control. 4,218,642, Cl. 318-696.000.

Johnson, Grover L.: *See*—
Deffeyes, Robert J.; and Johnson, Grover L., 4,218,507, Cl. 428-328.000.

Johnson, Howard L.: *See*—
DeGraw, Joseph I.; Lawson, John A.; Johnson, Howard L.; Loew, Gilda H.; and Berkowitz, Donald A., 4,218,454, Cl. 424-260.000.

Johnson, Norman S., to United Products Inc. Latch with multiple function prevailing-torque mechanism. 4,218,081, Cl. 292-66.000.

Johnson, Paul D.: *See*—
Snyder, John L.; and Johnson, Paul D., 4,218,248, Cl. 106-1.120.

Johnson, Paul E.: *See*—
Gattu, Narahari; and Johnson, Paul E., 4,217,987, Cl. 212-144.000.

Johnston, David B. R.: *See*—
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,218,463, Cl. 424-274.000.

Johnston, Jerome E.; Middendorf, Lyle R.; and Biggs, William W., to Lambda Instruments Co. Light meter. 4,218,140, Cl. 356-226.000.

Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., to New England Power Service Company. Method and apparatus for transmitting intelligence over a carrier wave. 4,218,655, Cl. 455-39.000.

Joly, Jean, to La Telemecanique Electrique. Electricity distribution column. 4,218,579, Cl. 174-48.000.

Jones, David T.: *See*—
Phillips, David J.; Jones, David T.; and Palmer, Douglas E., 4,218,490, Cl. 426-549.000.

Jones, Gerald P.: *See*—
Searfoss, William H.; and Jones, Gerald P., 4,218,361, Cl. 260-38.000.

Jones, Helene H.: *See*—
Withrington, Roger J.; Cook, Lacy G.; and Jones, Helene H., 4,218,111, Cl. 350-3.720.

Jones, Newlyn; and Stewart, Alistair C., to C. H. Dexter Limited. Paper having good absorbency and alkali resistance and method of making said paper. 4,218,286, Cl. 162-164.00R.

Jones, Raymond E., to Dura Corporation. Non-metallic hydraulic lift casing. 4,217,972, Cl. 187-8.410.

Joosten, Wesley L.; Mart, Carl F.; Miller, John W.; and Brown, Otice E., to Gus Manufacturing, Inc. Transmission line seismic communications system. 4,218,767, Cl. 367-79.000.

Jordan, William I. D., to Hawker Siddeley Aviation Limited. Semi-supine aircrew ejection seat. 4,218,035, Cl. 244-122.0AC.

Jujo Paper Co. Ltd.: *See*—
Yamato, Noboru; and Satake, Tosimi, 4,218,504, Cl. 428-207.000.

Jukhvid, Vladimir I.: *See*—
Merzhanov, Alexandr G.; Kachin, Alexandr R.; Jukhvid, Vladimir I.; Borovinskaya, Inna P.; and Vishnyakova, Galina A., 4,217,948, Cl. 164-115.000.

Julien, Hermann: *See*—
Neubeck, Kurt; and Julien, Hermann, 4,217,784, Cl. 73-732.000.

Jungles, John: *See*—
Whitehouse, David J.; and Jungles, John, 4,218,144, Cl. 356-446.000.

Jurgeleit, Wolfgang: *See*—
Winter, Hermann; Schroter, Gerhard; Jurgeleit, Wolfgang; Kalka, Josef; and Mihm, Bernhard, 4,218,553, Cl. 526-209.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Satoh, Katsuhiko; Mandai, Masaaki; and Shida, Masaharu, 4,217,751, Cl. 368-76.000.

Kabushiki Kaisha Hoya Lens: *See*—
Akaba, Hayao; Ikeda, Akira; and Lee, Masayoshi, 4,217,736, Cl. 51-284.00E.

Kabushiki Kaisha Morita Seisakusho: *See*—
Sugai, Hiroshi; and Ogawa, Haruo, 4,218,216, Cl. 433-104.000.

Kabushiki Kaisha Seikosha: *See*—
Okada, Mutsumi, 4,218,149, Cl. 400-124.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Imamura, Yoichi, 4,218,661, Cl. 331-116.0FE.
Kochi, Akihiko, 4,218,282, Cl. 156-620.000.

Kachin, Alexandr R.: *See*—
Merzhanov, Alexandr G.; Kachin, Alexandr R.; Jukhvid, Vladimir I.; Borovinskaya, Inna P.; and Vishnyakova, Galina A., 4,217,948, Cl. 164-115.000.

Kadija, Igor V.; and Woodard, Kenneth E., Jr., to Olin Corporation. Method of sealing separators for electrolytic cells for alkali metal chloride brines. 4,218,275, Cl. 156-73.100.

Kaiser Aluminum & Chemical Corporation: *See*—
Videtto, Ralph B., 4,218,256, Cl. 106-58.000.

Kakar, Sarwan K.: *See*—
Kappler, Frank R.; Cramer, John J.; and Kakar, Sarwan K., 4,218,220, Cl. 8-102.000.
Kalka, Josef: *See*—
Winter, Hermann; Schroter, Gerhard; Jurgeleit, Wolfgang; Kalka, Josef; and Mihm, Bernhard, 4,218,553, Cl. 526-209.000.
Kalnoki-Kis, Tibor, to Union Carbide Corporation. Nonaqueous electrochemical cell. 4,218,523, Cl. 429-101.000.
Kam, George H.; and Lovely, John D., to GTE Products Corporation. Television receiver picture tube protection circuit. 4,218,720, Cl. 361-93.000.
Kamata, Kunio: *See*—
Komatsu, Kazuhiro; Kamata, Kunio; and Kasai, Kenichi, 4,218,181, Cl. 415-189.000.
Kameya, Toru; and Aoyama, Yuji, to Taiyo Steel Co., Ltd. Electrostatic flock-coated metal sheet with excellent corrosion resistance and fabricability. 4,218,501, Cl. 428-90.000.
Kamiya, Osamu; and Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Optical system for copier. 4,218,134, Cl. 355-71.000.
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, to Fujisawa Pharmaceutical Company, Limited. Penam derivatives. 4,218,374, Cl. 260-245.20R.
Kamoda, Hitoshi: *See*—
Pu, Lyong S.; and Kamoda, Hitoshi, 4,218,529, Cl. 430-78.000.
Kamogawa, Hiroshi: *See*—
Sagae, Kyuta; Tanabe, Susumu; and Kamogawa, Hiroshi, 4,217,895, Cl. 128-214.400.
Kamyr Valves, Inc.: *See*—
Kindersley, Peter G., 4,217,923, Cl. 137-315.000.
Kaneko, Tamaki: *See*—
Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,128, Cl. 355-14.0SH.
Satomi, Toyokazu; Koizumi, Yutaka; Miyakawa, Seiichi; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,130, Cl. 355-14.00R.
Kaneno, Masayuki: *See*—
Oda, Isao; and Kaneno, Masayuki, 4,218,257, Cl. 106-73.500.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Oda, Shinichi; Aoyagi, Shoji; Kuroda, Takio; and Tozaki, Eishun, 4,218,506, Cl. 428-327.000.
Kappler, Frank R.; Cramer, John J.; and Kakar, Sarwan K., to BASF Wyandotte Corporation. Method of fading blue jeans. 4,218,220, Cl. 8-102.000.
Karacsonyi nee Spindler, Eva: *See*—
Nadasy, Miklos; Kovacs, Miklos; Kolcsei, Marton; Vad, Janos; Bartha, Bela; Dobozy, Otto; Mate, Ferenc; and Karacsonyi nee Spindler, Eva, 4,218,234, Cl. 71-86.000.
Karlsson, Gustav, to GK Haninge Maskiner AB. Snow retaining gate for snow plow. 4,217,707, Cl. 37-41.000.
Karlsson, Lennart E.: *See*—
Joensson, Aake N.; Merenyi, Ferenc; Moses, Pinchas; Karlsson, Lennart E.; and Hanshoff, Gunnar, 4,218,476, Cl. 424-321.000.
Karr, Ralph G. Fishing rod holder. 4,217,720, Cl. 43-17.000.
Kasai, Kenichi: *See*—
Komatsu, Kazuhiro; Kamata, Kunio; and Kasai, Kenichi, 4,218,181, Cl. 415-189.000.
Kashigi, Kazuo, to Nippon Electric Company, Ltd. Luminance/-chrominance separating apparatus having a spatial filtering effect. 4,218,700, Cl. 358-31.000.
Kashigi, Kazuo; and Koyama, Toshitake, to Nippon Electric Company, Ltd. Digital video effect system comprising only one memory of a conventional capacity. 4,218,710, Cl. 358-183.000.
Kashigi, Kazuo, to Nippon Electric Company, Ltd. Special effect device for electronically accomplishing a gradual scene shift. 4,218,711, Cl. 358-183.000.
Kasprzak, Kenneth A., to Dow Corning Corporation. Polish formulations. 4,218,250, Cl. 106-3.000.
Kasthuri-Thirumalachar, Mandayam J.: *See*—
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J., Jr.; and Kasthuri-Thirumalachar, Mandayam J., 4,218,445, Cl. 424-230.000.
Kato, Kumiko: *See*—
Saito, Masao; Mizuno, Kinichi; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,218,398, Cl. 260-561.00R.
Katz, Joseph. Process for testing of hydraulic release devices. 4,217,772, Cl. 73-4.00R.
Kaufman, Harvey L.: *See*—
Fellman, Jack D.; Kaufman, Harvey L.; and Stobbe, Alan W., 4,218,292, Cl. 204-55.00R.
Kaufman, Lance R. Compact circuit package having improved circuit connectors. 4,218,724, Cl. 361-395.000.
Kaufman, Robert J.: *See*—
Franz, John E.; and Kaufman, Robert J., 4,218,235, Cl. 71-86.000.
Kaufmann, Meinolph: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., 4,218,281, Cl. 156-281.000.
Kawabata, Nobuaki; and Yokoyama, Nobuo, to Nippon Oil Company, Ltd. Process for preparing oxygen-containing waxes. 4,218,263, Cl. 106-270.000.
Kawamura, Kunio; Yasukuni, Mitsuo; Iida, Takashi; and Suzuki, Yuziro, to Minolta Camera Kabushiki Kaisha. Electrochromic light regulator. 4,218,120, Cl. 354-227.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishikawa, Yoshiyasu; and Nakano, Masao, 4,218,190, Cl. 416-186.00R.
Kawasaki Kasei Chemicals Limited: *See*—
Matsuura, Ryo; Segawa, Tomio; Nomiyama, Yukio; Kumada, Yoichi; and Sawada, Hideo, 4,218,376, Cl. 260-314.500.
Kaye, Ronald S. Rollers. 4,217,967, Cl. 180-20.000.
Kayukawa, Naoyuki; and Ozawa, Yasutomo, to Hokkaido University, The President of. MHD Power generator. 4,218,629, Cl. 310-11.000.
Kelley, Ishmael C.; and Brailsford, Lawrence J. Electronic alarm signaling system. 4,218,763, Cl. 340-65.000.
Kelly, James V. Energy saving system for retrieving heat loss from an electrical apparatus. 4,217,952, Cl. 165-39.000.
Kelly, Samuel T., to Robertshaw Controls Company. Gas regulator valve with step opening characteristic. 4,217,928, Cl. 137-495.000.
Kemp, Dennis E., Jr. Sealed hanger bearing for auger conveyor. 4,217,980, Cl. 198-666.000.
Kempe, Tomas G.: *See*—
Joensson, Aake N.; Kempe, Tomas G.; Mikiver, Lembit; and Sparf, Bengt A., 4,218,472, Cl. 424-316.000.
Kendall Company, The: *See*—
Layton, Terry N., 4,217,911, Cl. 128-748.000.
Kendrick, William D., to Halliburton Company. Repairable composite seal ring. 4,218,080, Cl. 285-347.000.
Kennedy, Bruce W.: *See*—
Chase, John D.; Galvez, Buenaventura B.; and Kennedy, Bruce W., 4,218,569, Cl. 568-697.000.
Kennedy, Peter D., to Motorola, Inc. Coded coherent transponder. 4,218,680, Cl. 343-6.80R.
Kennedy, Ray A.: *See*—
Stead, Emmett T.; and Kennedy, Ray A., 4,218,492, Cl. 426-646.000.
Kenney, Harold E.: *See*—
Schwab, Arthur W.; Gast, Lyle E.; and Kenney, Harold E., 4,218,332, Cl. 252-48.600.
Kervogoret, Gilbert, to Societe Anonyme D.B.A. Antiskid brake system comprising a fluid replenishing device, and a replenishing device for such a system. 4,218,100, Cl. 303-119.000.
Kesling, Keith, to General Motors Corporation. Steering column for vehicles. 4,217,792, Cl. 74-484.00R.
Kessler, Richard V.: *See*—
Nolan, John T., Jr.; McMahon, Matthew A.; Kessler, Richard V.; and Corbeels, Roger J., 4,218,222, Cl. 48-202.000.
Keyes Fibre Company: *See*—
Veilleux, Gerald R., 4,218,008, Cl. 229-2.50R.
Khajutin, Sergei G.: *See*—
Batova, Margarita I.; Meschaninov, Igor V.; Khajutin, Sergei G.; Shapiro, Sergei L.; and Shpichinetsky, Efim S., 4,218,245, Cl. 75-170.000.
Khalil, Hassan H., to United States of America, Navy. Internal jugular and left ventricular thermodilution catheter. 4,217,910, Cl. 128-670.000.
Khattak, Chandra P.: *See*—
Schmid, Frederick; and Khattak, Chandra P., 4,218,418, Cl. 264-299.000.
Kibler, Roland G.: *See*—
Madsen, Wayne A.; Kibler, Roland G.; and Ely, Jeffrey A., 4,217,867, Cl. 123-350.000.
Kiefer, Hans: *See*—
Hohenschutz, Heinz; Schmidt, Johannes E.; and Kiefer, Hans, 4,218,568, Cl. 562-609.000.
Kiehl, Jean-Pierre; and Clavaud, Bernard A., to Societe Europeenne des Produits Refractaires. Refractory compositions suitable for preparing low water-content injectable pastes. 4,218,254, Cl. 106-44.000.
Kiesel, Kenneth C., to Polaroid Corporation. Electrical mean square voltage sensor. 4,218,627, Cl. 307-311.000.
Kif-Parechoc S.A.: *See*—
Loretan, Edouard, 4,217,753, Cl. 368-324.000.
Kii, Masami, to Mitsubishi Denki Kabushiki Kaisha. Gas-blast type circuit interrupter. 4,218,597, Cl. 200-148.00R.
Kikuchi, Minoru: *See*—
Sakamoto, Shigeru; Moriyama, Hiroyuki; Fujii, Ryosuke; Ishii, Toshiharu; Sugawara, Isao; and Kikuchi, Minoru, 4,217,762, Cl. 62-132.000.
Killam, R. William: *See*—
Kryger, David L.; and Killam, R. William, 4,218,142, Cl. 356-394.000.
Kilpelainen, Ossi, to Enso-Gutzeit Osakeyhtio. Chip washer. 4,217,917, Cl. 134-104.000.
Kim, Yang K., to Allied Chemical Corporation. External lubricant compositions for rigid vinyl polymers. 4,218,353, Cl. 260-28.50D.
Kimball International, Inc.: *See*—
Wilcox, Brian N.; and Robinson, John W., 4,217,801, Cl. 84-1.010.
Kimura, Fumio: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Kimura, Fumio; Nasu, Rikuo; Sakashita, Nobuyuki; and Nishimura, Shigeyuki, 4,218,237, Cl. 71-94.000.
Kimura, Katsuhiko: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, 4,218,135, Cl. 355-72.000.
Kimzey, Gene A.: *See*—
Rasmussen, Harry R.; and Kimzey, Gene A., 4,218,590, Cl. 179-99.00E.
Kindersley, Peter G., to Kamyr Valves, Inc. Ball valve with readily removable ball and seats for high temperature environment. 4,217,923, Cl. 137-315.000.
King, Hugh C.: *See*—
Beasley, Max M.; Defore, Leroy A.; and King, Hugh C., 4,217,837, Cl. 112-79.00R.

King, Paul E.: *See*—
Pratt, Wayne L.; and King, Paul E., 4,218,744, Cl. 364-442.000.
King, Randall N.: *See*—
Dunn, Bruce S.; Breiter, Manfred W.; and King, Randall N., 4,218,524, Cl. 429-104.000.
King, Robert W., to Avco Corporation. Method for making 3-D structures. 4,218,276, Cl. 156-92.000.
Kinkade, Robert R., to Standard Oil Company (Indiana). Two-dimensional frequency domain filtering. 4,218,765, Cl. 367-45.000.
Kinsekisha Laboratory, Ltd.: *See*—
Yamaguchi, Kazumasa, 4,218,631, Cl. 310-312.000.
Kirchhoff, Franz J.; and Brandt, Joachim, to Apparatebau Rothemuhle Brandt & Kritzler. Electrostatic precipitators. 4,218,225, Cl. 55-112.000.
Kirsch, Bernhard; and Wener, Josef. Asynchronous machines. 4,218,645, Cl. 322-47.000.
Kirschmann, John D. Reverse osmosis water purifier. 4,218,317, Cl. 210-117.000.
Kissner, William R., to W. H. Brady Co. Connecting flexible switch. 4,218,600, Cl. 200-159.00B.
Kitajima, Tadayuki: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,218,131, Cl. 355-15.000.
Kitamura, Nobuyoshi: *See*—
Takeuchi, Kouji; Nakamura, Masao; Kitamura, Nobuyoshi; and Matsuura, Shohachi, 4,218,352, Cl. 260-23.0XA.
Kitayama, Akira: *See*—
Etoh, Yuichi; Kitayama, Akira; Kobayashi, Sadami; and Okazaki, Shigeyoshi, 4,218,428, Cl. 423-242.000.
Kitchen, Leland G.: *See*—
Reber, Martin R.; and Kitchen, Leland G., 4,218,194, Cl. 417-364.000.
Kiyonaga, Kingo; Okuno, Toshio; and Tokuda, Kenji, to Hitachi Metals, Ltd. Fully martensitic steel for a metal mold for molding glass and the metal mold. 4,218,243, Cl. 75-124.000.
Klauke, Erich: *See*—
Wolfrum, Gerhard; Klauke, Erich; and Otten, Hans-Gunter, 4,218,373, Cl. 260-198.000.
Klein, Dieter: *See*—
Wiegner, Georg; Schwolow, Hartmut; Klein, Dieter; and Malaskiewicz, Juergen, 4,217,900, Cl. 128-285.000.
Kliemann, Siegfried: *See*—
Henning, Herbert; and Kliemann, Siegfried, 4,218,408, Cl. 261-112.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Herchenbach, Horst, 4,218,210, Cl. 432-106.000.
Schleiermacher, Herbert, 4,217,870, Cl. 123-572.000.
Klockner-Humboldt-Wedag AG: *See*—
Herchenbach, Horst; and Ramesohl, Hubert, 4,218,209, Cl. 432-14.000.
Klygis, Mindaugas J., to Illinois Tool Works Inc. Bottle carrier. 4,218,086, Cl. 294-87.200.
Knapheide Mfg. Co., The: *See*—
Leaver, John Y., 4,218,094, Cl. 298-17.00B.
Kneusels, Max B., to General Motors Corporation. Electrical connector assembly. 4,218,109, Cl. 339-147.00R.
Knosp, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Gold alloy for firing on porcelain for dental purposes. 4,218,244, Cl. 75-165.000.
Kobayashi, Akio; Shimohiro, Yoshiyuki; Shimizu, Kisaburou; and Murakami, Yoshiaki, to Dainippon Pharmaceutical Co., Ltd. Condensation product of 4,4'-dihydroxydiphenyl sulfone, 4,4'-dihydroxydiphenylsulfone sulfonic acid and a lower aldehyde and method of preparation. 4,218,366, Cl. 528-143.000.
Kobayashi, Hiroo: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,218,131, Cl. 355-15.000.
Kobayashi, Sadami: *See*—
Etoh, Yuichi; Kitayama, Akira; Kobayashi, Sadami; and Okazaki, Shigeyoshi, 4,218,428, Cl. 423-242.000.
Koberstein, Edgar: *See*—
Lakatos, Eduard; Koberstein, Edgar; Hensel, Jorg; and Bozon, Alfred, 4,218,341, Cl. 252-430.000.
Kochi, Akihiko, to Kabushiki Kaisha Suwa Seikosha. Method of preparation of chrysoberyl and beryl single crystals. 4,218,282, Cl. 156-620.000.
Koeln, Harold E., to Penn Corporation. Conical pen. 4,217,712, Cl. 40-334.000.
Koenig, Claus; and Koenig, Reinhard, to Claus Koenig K.G. Glue dispenser in form of a bottle. 4,217,994, Cl. 222-212.000.
Koenig, Reinhard: *See*—
Koenig, Claus; and Koenig, Reinhard, 4,217,994, Cl. 222-212.000.
Koepplin, Gilbert L. Unpowered support vehicle. 4,218,070, Cl. 280-28.500.
Koerte, Klaus, to Sandoz Ltd. Azo compounds having a β-alkynyloxy carbonylalkyl group on the coupling component radical. 4,218,372, Cl. 260-196.000.
Koh, Kook-Wha. Cooling and lubricating fluid for metal working. 4,218,329, Cl. 252-46.400.
Kohl, William F., Jr.: *See*—
Hilbert, Robert A.; Kohl, William F., Jr.; Whelan, Joseph M.; and Apichella, John L., 4,218,058, Cl. 273-1.50R.
Kohlmann, Friedrich W.: *See*—
Fleig, Helmut; Hagen, Helmut; Dockner, Toni; and Kohlmann, Friedrich W., 4,218,460, Cl. 424-270.000.
Koike, Kiyoshi: *See*—
Sonoda, Noriaki; and Koike, Kiyoshi, 4,217,953, Cl. 165-44.000.
Koiso, Junichi: *See*—
Iwai, Fumio; Kokiso, Masakazu; Koiso, Junichi; and Ogino, Tamio, 4,218,132, Cl. 355-15.000.
Koizumi, Yutaka: *See*—
Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,128, Cl. 355-14.0SH.
Satomi, Toyokazu; Koizumi, Yutaka; Miyakawa, Seiichi; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,130, Cl. 355-14.00R.
Kojima, Sadao, to Iida, Kosaku. Water filtration apparatus. 4,218,322, Cl. 210-391.000.
Kokiso, Masakazu: *See*—
Iwai, Fumio; Kokiso, Masakazu; Koiso, Junichi; and Ogino, Tamio, 4,218,132, Cl. 355-15.000.
Kokoku Steel Casting Company, Limited: *See*—
Murahashi, Taro; and Ogino, Yukuo, 4,217,946, Cl. 164-12.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Ogawa, Akira; Watanabe, Tatsuo; and Saito, Hideki, 4,218,654, Cl. 370-97.000.
Kolbl, Heinz: *See*—
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.
Kolcsei, Marton: *See*—
Nadasy, Miklos; Kovacs, Miklos; Kolcsei, Marton; Vad, Janos; Bartha, Bela; Dobozy, Otto; Mate, Ferenc; and Karacsonyi nee Spindler, Eva, 4,218,234, Cl. 71-86.000.
Koliba, Melvin J.; Oakes, Clarence D., Jr.; and Napel, Larry P., to General Motors Corporation. Chock device for a transporting vehicle. 4,217,831, Cl. 410-121.000.
Komatsu, Hiroki; and Oka, Tsumoru, to Alps Electric Co., Ltd. Rotary switch assembly. 4,218,594, Cl. 200-11.00G.
Komatsu, Kazuhiro; Kamata, Kunio; and Kasai, Kenichi, to Hitachi, Ltd. Barrel type centrifugal turbo-machine. 4,218,181, Cl. 415-189.000.
Komoriya, Susumu; Morita, Koyo; Nishizuka, Hiroshi; and Maejima, Hisashi, to Hitachi, Ltd. Method of and apparatus for aligning photomask. 4,218,136, Cl. 355-79.000.
Kondo, Minoru, to Pioneer Electronic Corporation. Automatic gain control circuit. 4,218,774, Cl. 455-249.000.
Kondur, Nicholas, Jr., to LRC, Inc. Serial impact calculator printer. 4,218,151, Cl. 400-314.100.
Konig, Hans-Bodo: *See*—
Feyen, Peter; Konig, Hans-Bodo; and Metzger, Karl G., 4,218,451, Cl. 424-250.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Iwai, Fumio; Kokiso, Masakazu; Koiso, Junichi; and Ogino, Tamio, 4,218,132, Cl. 355-15.000.
Nakagawa, Yasutsugu; and Yagi, Michio, 4,218,121, Cl. 354-271.000.
Shimada, Fumio; Matsuzaki, Masatoshi; and Uehara, Masafumi, 4,218,528, Cl. 430-76.000.
Shinozaki, Sohji; Takei, Yoshiaki; and Iwahashi, Haruo, 4,218,124, Cl. 355-3.0SC.
Konoki, Keizo; and Nobue, Michio, to Mitsui Toatsu Chemicals, Inc.; and Toyo Engineering Corporation. Method for eliminating the explosibility of tail gas from the urea synthesis plant. 4,218,397, Cl. 260-555.00A.
Kontani, Kazuo: *See*—
Ohashi, Kanji; Kontani, Kazuo; Uchiyama, Yoshitada; and Motohashi, Kinichi, 4,217,871, Cl. 123-501.000.
Kooichi, Yoshida; Eitoshi, Shozi; Hiroshi, Ootaki; and Takashi, Terada, to Nippon Kayaku Kabushiki Kaisha. Constant-rate eluting tablet and method of producing same. 4,218,433, Cl. 424-15.000.
Koppers Company, Inc.: *See*—
Hill, Robert E., 4,218,249, Cl. 106-2.000.
Koreeda, Kiyoshi: *See*—
Daido, Toshihiko; Koreeda, Kiyoshi; Kunimatsu, Hiroshi; and Tabata, Kinji, 4,217,841, Cl. 112-277.000.
Korzeniewski, Eugene C., to Avery International Inc. Web feed mechanism. 4,218,030, Cl. 242-67.200.
Koshiishi, Kiyozo, to Olympus Optical Co., Ltd. Method and apparatus for calibrating ion concentration measurement. 4,218,746, Cl. 364-571.000.
Koss, George A.: *See*—
Timmons, William K.; and Koss, George A., 4,217,992, Cl. 221-113.000.
Kotone, Akira: *See*—
Watanabe, Koichi; Harada, Hiroaki; and Kotone, Akira, 4,218,432, Cl. 424-14.000.
Koundakjian, Theodore H., to Chevron Research Company. Insecticidal formulation. 4,218,444, Cl. 424-212.000.
Kouvoussis, Anthony E.: *See*—
Carter, Ernest A.; and Kouvoussis, Anthony E., 4,218,750, Cl. 364-770.000.
Kovacs, Miklos: *See*—
Nadasy, Miklos; Kovacs, Miklos; Kolcsei, Marton; Vad, Janos; Bartha, Bela; Dobozy, Otto; Mate, Ferenc; and Karacsonyi nee Spindler, Eva, 4,218,234, Cl. 71-86.000.

Koyama, Toshitake: *See*—
Kashigi, Kazuo; and Koyama, Toshitake, 4,218,710, Cl. 358-183.000.

Koyo Machine Industries Company Limited: *See*—
Daido, Toshihiko; Koreeda, Kiyoshi; Kunimatsu, Hiroshi; and Tabata, Kinji, 4,217,841, Cl. 112-277.000.

Koyo Seiko Company Limited: *See*—
Daido, Toshihiko; Koreeda, Kiyoshi; Kunimatsu, Hiroshi; and Tabata, Kinji, 4,217,841, Cl. 112-277.000.

Kozima, Yusuke; Matsui, Hideo; and Chikakiyo, Takao, to Nippon Steel Corporation. Apparatus for producing solidified granular slag from molten blast furnace slag. 4,218,201, Cl. 425-7.000.

Kraska, John L., to National Can Corporation. Method and apparatus for forming ends. 4,217,843, Cl. 113-121.00C.

Krasnokutsky, Valentin P.: *See*—
Brusilovsky, Mikhail G.; Krasnokutsky, Valentin P.; Nemtinova, Galina I.; Novozhilov, Evgeny N.; Pekarsky, Viktor A.; Platonova, Svetlana A.; and Tumansky, Alexandr S., 4,218,390, Cl. 260-453.0AB.

Kraus, Thaddaus, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Vacuum evaporation apparatus. 4,217,856, Cl. 118-724.000.

Krehl, William H.; and DeHart, John R., to Docutronix, Inc. Magnetic signal detector. 4,218,612, Cl. 235-449.000.

Kreinick, Stephen J.: *See*—
Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., 4,218,675, Cl. 340-347.0AD.

Krobel, Heinz; and Bauer, Walter, to AGFA-Gevaert, A.G. Apparatus for singularizing stacked dielectric receptor sheets for latent images. 4,218,055, Cl. 271-106.000.

Krobel, Heinz: *See*—
Bauer, Walter; Krobel, Heinz; and Muller, Jurgen, 4,218,054, Cl. 271-11.000.

Kroger, Keijo K.; and Ojanen, Pekka E., to Valmet Oy. Load-transporting method and apparatus. 4,218,174, Cl. 414-786.000.

Kroner, Michael, to BASF Aktiengesellschaft. Manufacture of vinyllactonitrile. 4,218,393, Cl. 260-465.600.

Kryger, David L.; and Killam, R. William, to Aerodyne Research, Inc. Mask analysis. 4,218,142, Cl. 356-394.000.

Kubota Ltd.: *See*—
Hiraishi, Hisashi; Morichika, Toshiaki; Murakami, Shinichi; and Akamatsu, Katsutaro, 4,218,268, Cl. 148-38.000.

Kudchadker, Mohan V.: *See*—
Doster, Martha S.; and Kudchadker, Mohan V., 4,217,958, Cl. 166-274.000.

Kuehnel, Werner, to Siemens Aktiengesellschaft. Inverter comprising at least two controllable load thyristors. 4,218,731, Cl. 363-136.000.

Kumada, Yoichi: *See*—
Matsuura, Ryo; Segawa, Tomio; Nomiyama, Yukio; Kumada, Yoichi; and Sawada, Hideo, 4,218,376, Cl. 260-314.500.

Kumagaya, Masao: *See*—
Iwasaki, Sadayoshi; and Kumagaya, Masao, 4,218,598, Cl. 200-153.00J.

Kunimatsu, Hiroshi: *See*—
Daido, Toshihiko; Koreeda, Kiyoshi; Kunimatsu, Hiroshi; and Tabata, Kinji, 4,217,841, Cl. 112-277.000.

Kuppers, Walter; and Della Mura, Pasquale, to Merck Patent Gesellschaft mit beschrankter Haftung. Casein-based dietetic foodstuff and process for its production. 4,218,483, Cl. 426-72.000.

Kuraray Co., Ltd.: *See*—
Minatono, Shobu; and Takamatsu, Hideo, 4,218,349, Cl. 260-5.000.
Shimada, Kiyoo; Matuo, Masayuki; and Esashi, Masayoshi, 4,218,298, Cl. 204-195.00M.

Kure Tekko Company Ltd.: *See*—
Sumikawa, Satoshi, 4,217,677, Cl. 16-119.000.

Kuroda, Takio: *See*—
Oda, Shinichi; Aoyagi, Shoji; Kuroda, Takio; and Tozaki, Eishun, 4,218,506, Cl. 428-327.000.

Kuroki, Yoshihiro: *See*—
Hayashi, Seizo; Tsutsumi, Shinya; and Kuroki, Yoshihiro, 4,217,674, Cl. 15-361.000.

Kustom Fit Manufacturing Company: *See*—
Webster, David L., 4,218,091, Cl. 297-354.000.

Kutik, Louis F.; and Cecil, Howard E., to Security Plastics, Inc. Pump having non-throttling peripheral valve. 4,218,198, Cl. 417-566.000.

Kutzavitch, Walter G., to Bell Telephone Laboratories, Incorporated. High voltage leakage and breakdown test circuit. 4,218,649, Cl. 324-54.000.

La Telemecanique Electrique: *See*—
Joly, Jean, 4,218,579, Cl. 174-48.000.

LaBelle, Gerald G.; and Staehler, Glenn E., to Dairyland Food Laboratories, Inc. Phage detection. 4,218,534, Cl. 435-5.000.

Ladner, William R.: *See*—
Finn, Michael J.; Ladner, William R.; and Newman, John O. H., 4,218,303, Cl. 208-8.00R.

Lafuze, David L., to General Electric Company. Phase angle balancing circuit for a variable speed constant frequency power system. 4,218,732, Cl. 363-160.000.

Lakatos, Eduard; Koberstein, Edgar; Hensel, Jorg; and Bozon, Alfred, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the application of a catalytically active coating on a catalyst carrier. 4,218,341, Cl. 252-430.000.

Lamb, W. C.: *See*—
Pont, Glen W., 4,217,782, Cl. 73-637.000.

Lambda Instruments Co.: *See*—
Johnston, Jerome E.; Middendorf, Lyle R.; and Biggs, William W., 4,218,140, Cl. 356-226.000.

Lamberti, Vincent: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,218,381, Cl. 260-343.600.

Lancellotti, Joseph J. Amalgam carrier and condenser. 4,218,215, Cl. 433-90.000.

Lang, Erich: *See*—
Hubmann, Max; Lang, Erich; and Menke, Franz, 4,217,912, Cl. 128-774.000.

Lang, Gerard: *See*—
Jacquet, Bernard; and Lang, Gerard, 4,217,914, Cl. 132-7.000.

Langen, Hans, to Sack GmbH. Multiple-part hobbing cutter. 4,218,159, Cl. 407-25.000.

Langer, Salomon Z.; and Roach, Allan G., to Synthelabo. Method of treating gastric and duodenal ulcers. 4,218,466, Cl. 424-275.000.

Lansing Bagnall Limited: *See*—
Goodacre, Cecil, 4,218,170, Cl. 414-666.000.

Lante-Montefeltro Della Rovere, Ludovico. Reusable target pigeon for autoloading launcher. 4,218,061, Cl. 273-364.000.

Larson, Walter F., to Terrain King Corporation. Hydraulic drive means and controls therefor. 4,217,789, Cl. 74-470.000.

Lasiter, Steven M.: *See*—
Vanecek, Michael J.; Piepenhagen, John H. K.; Neale, Michael J.; Lasiter, Steven M.; and Bailey, Raymond A., 4,218,048, Cl. 266-236.000.

Laskody, Jerome R., to Boeing Commercial Airplane Company. Vortex mixers for reducing the noise emitted by jet engines. 4,217,756, Cl. 60-262.000.

Laticrete International, Inc.: *See*—
Rothberg, Henry M., 4,218,258, Cl. 106-93.000.

Lavanish, Jerome M., to PPG Industries, Inc. 3-[5-[1-(2-, 3-, or 4-methyl, or ethyl or isopropylphenoxy) alkyl, alkynyl, haloalkyl]-1,3,4-thiadiazol-2-yl]-4-hydroxy-1-methyl methyl-2-imidazolidinones. 4,218,236, Cl. 71-90.000.

Lawrence, Michael J.: *See*—
Stringham, Leroy O.; and Lawrence, Michael J., 4,218,497, Cl. 427-289.000.

Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; and Wheldon, Alfred G., to Brewing Research Foundation, The. Hop extraction with carbon dioxide. 4,218,491, Cl. 426-600.000.

Lawson, John A.: *See*—
DeGraw, Joseph I.; Lawson, John A.; Johnson, Howard L.; Loew, Gilda H.; and Berkowitz, Donald A., 4,218,454, Cl. 424-260.000.

Layton, Terry N., to Kendall Company, The. Cystometry system. 4,217,911, Cl. 128-748.000.

Lazarus, Michel, to Thomson-CSF. Arrangement for the remote transmission of information for the remote guidance of vehicles which are subject to severe acceleration. 4,218,656, Cl. 455-59.000.

Le Materiel Telephonique: *See*—
Dieudonne, Marc P. G., 4,218,588, Cl. 370-59.000.

Leaver, John Y., to Knapheide Mfg. Co., The. Safety brace. 4,218,094, Cl. 298-17.00B.

Le Deit, Gerard: *See*—
Johns, Christopher; and Le Deit, Gerard, 4,217,973, Cl. 188-1.00A.

Lee, Alan S., to English Electric Company Limited, The. Pipe connections. 4,218,078, Cl. 285-115.000.

Lee, George A., to Dow Chemical Company, The. Epoxy-carbonyl compositions as photopolymerization initiators. 4,218,295, Cl. 204-159.230.

Lee, Jean; Shaw, Janice R.; Giuliano, Carmine; and Butera, Ned, to General Foods Corporation. Process for preparing a baked coated comestible. 4,218,485, Cl. 426-296.000.

Lee, Jong I.: *See*—
Sigmund, Phillip M.; Lee, Jong I.; and Fosti, James E., 4,217,955, Cl. 166-252.000.

Lee, Jong W.: *See*—
Gross, Benjamin; and Lee, Jong W., 4,218,306, Cl. 208-120.000.

Lee, Kyu H.: *See*—
Aid, James D.; and Lee, Kyu H., 4,218,313, Cl. 210-22.00A.

Lee, Masayoshi: *See*—
Akaba, Hayao; Ikeda, Akira; and Lee, Masayoshi, 4,217,736, Cl. 51-284.00E.

Lee, Russell: *See*—
Heffner, Ronald J.; and Lee, Russell, 4,218,725, Cl. 362-20.000.

Lee, William W.: *See*—
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Lu, Chin H., to Xerox Corporation. Single component magnetic toner. 4,218,530, Cl. 430-107.000.
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Madden, John F., to United Technologies Corporation. Constant frequency bifilar vibration absorber. 4,218,187, Cl. 416-145.000.
Maddox, Roy L., Jr., to Rockwell International Corporation. Microelectronic fabrication method minimizing threshold voltage variation. 4,218,267, Cl. 148-1.500.
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Magnuson, Lars. Storing and dispensing box. 4,217,984, Cl. 206-403.000.
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Maroney, Michael V. Multiple duct blow dryer and hair styler. 4,218,608, Cl. 219-368.000.
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Masaki, Kenji, to Nissan Motor Company, Limited. Method of controlling the air-fuel ratio of an air-fuel mixture provided for an internal combustion engine and a system for executing the method. 4,217,869, Cl. 123-438.000.
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Maselli, Stephen A., to Sybron Corporation. Adaptive gain controller. 4,218,733, Cl. 364-105.000.
Masuda, Noboru; and Suzuki, Mitsuyuki, to Denki Onkyo Co., Ltd.; and Aisin Seiki Kabushiki Kaisha. Liquid level sensing means. 4,217,779, Cl. 73-313.000.
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Mathews, Bernard C. Bin grain dryer. 4,217,701, Cl. 34-211.000.
Matschke, Arthur L., to Printer Associates. Matrix printing cell and head assembly. 4,218,148, Cl. 400-124.000.
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McCarthy, Charles J.; and Green, Maurice, to United States of America, Health, Education and Welfare. Automated test tube stopper remover. 4,217,798, Cl. 81-3.200.
McCarthy, Edward F.: *See*—
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McCracken, David A., to Gala Industries, Inc. Pellet free rotor for centrifugal pellet dryers. 4,218,323, Cl. 210-415.000.
McCutcheon, James T., to Minnesota Mining and Manufacturng Company. Digital motor control system. 4,218,735, Cl. 364-118.000.
McDaniel, Carl V., to W. R. Grace & Co. Hydrocarbon cracking catalyst. 4,218,307, Cl. 208-120.000.
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McKay, Dwight L., to Phillips Petroleum Company. Passivating metals on cracking catalysts with tellurium. 4,218,337, Cl. 252-411.00R.
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McMackin, Edwin E.; and McMackin, Waymon E. Apparatus and method for fabricating stake flags. 4,218,278, Cl. 156-187.000.
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McMahon, Matthew A.: *See*—
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McManigal, David F., to International Business Machines Corporation. Absolute difference generator for use in display systems. 4,218,751, Cl. 364-784.000.
McMullen, Malcolm. Insect trap. 4,217,722, Cl. 43-114.000.
McMullin, Edward J., Jr. Apparatus for separation of suspensions. 4,218,325, Cl. 210-521.000.
McMurtry, Carl H.; Naum, Robert G.; and Forsyth, Paul F., to Carborundum Company, The. Neutron absorbing article and method for manufacture thereof. 4,218,622, Cl. 250-518.000.
McPherson, William E.; and Rowe, David W., to McPherson, William E.; and Harrell, Gary W., part interest to each. Windmill construction. 4,218,184, Cl. 416-17.000.
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Pearson, Robert J., 4,217,673, Cl. 15-235.700.
Naum, Robert G.: *See*—
McMurtry, Carl H.; Naum, Robert G.; and Forsyth, Paul F., 4,218,622, Cl. 250-518.000.
Navarro, Sam J.: *See*—
Swindlehurst, Carl P.; and Navarro, Sam J., 4,218,088, Cl. 296-137.00R.
Nawrot. Chester R., to Hooker Chemicals & Plastics Corp. Electrochemical apparatus and process for manufacturing halates. 4,218,293, Cl. 204-95.000.
Neale, Michael J.: *See*—
Vanecek, Michael J.; Piepenhagen, John H. K.; Neale, Michael J.; Lasiter, Steven M.; and Bailey, Raymond A., 4,218,048, Cl. 266-236.000.
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, to Roussel Uclaf. 4H-Thieno-[3,2-b][1]-benzazepines. 4,218,375, Cl. 260-330.300.
Neff, Thomas: *See*—
Schwenzfeier, Werner; Neff, Thomas; and Wiesbauer, Karl, 4,218,029, Cl. 242-56.900.
Negi, Virendra S.; and Miu, Ming T., to Honeywell Information Systems Inc. Data processing interrupt apparatus having selective suppression control. 4,218,739, Cl. 364-200.000.
Nelson, Howard T., to RCA Corporation. Guide wing for a furnace paddle. 4,218,214, Cl. 432-258.000.
Nemtinova, Galina I.: *See*—
Brusilovsky, Mikhail G.; Krasnokutsky, Valentin P.; Nemtinova, Galina I.; Novozhilov, Evgeny N.; Pekarsky, Viktor A.; Platonova, Svetlana A.; and Tumansky, Alexandr S., 4,218,390, Cl. 260-453.0AB.
Netravali, Arun N.; and Robbins, John D., to Bell Telephone Laboratories, Incorporated. Technique for estimation of displacement and/or velocity of objects in video scenes. 4,218,703, Cl. 358-136.000.
Netravali, Arun N.; and Robbins, John D., to Bell Telephone Laboratories, Incorporated. Method and apparatus for video signal encoding with motion compensation. 4,218,704, Cl. 358-136.000.
Neubeck, Kurt; and Julien, Hermann, to Alexander Wiegand GmbH & Co. Armaturen- und Manometerfabrik. Tube spring manometer. 4,217,784, Cl. 73-732.000.
Neuhaeusser, Horst; and Storm, Ole, to Neuhaeusser, Horst. Device for storing and readying of magnetic tape cassettes. 4,217,991, Cl. 221-89.000.
Neville, George E., to George Neville Truck Equipment Limited. Covered vehicle container bodies. 4,218,087, Cl. 296-100.000.
New England Power Service Company: *See*—
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,218,655, Cl. 455-39.000.
Newman, John O. H.: *See*—
Finn, Michael J.; Ladner, William R.; and Newman, John O. H., 4,218,303, Cl. 208-8.00R.
Newman, Raymond A., to NP Industries, Inc. Flow measuring system. 4,217,777, Cl. 73-198.000.
Newrick, George M., to Davy International (Oil & Chemicals) Limited. Solvent extractor. 4,218,311, Cl. 210-21.000.
NGK Insulators, Ltd.: *See*—
Oda, Isao; and Kaneno, Masayuki, 4,218,257, Cl. 106-73.500.
NGK Spark Plug Co. Ltd.: *See*—
Nishio, Kanemitsu; Suzuki, Takashi; Uenaga, Toshihiko; and Zega, Fumio, 4,217,873, Cl. 123-653.000.
(Nihon Rajiecta Kabushiki Kaisha: *See*—
Sonoda, Noriaki; and Koike, Kiyoshi, 4,217,953, Cl. 165-44.000.
Niimi, Masaaki: *See*—
Niimi, Tadashi; Niimi, Masanori; and Arimizu, Tsutomu, 4,218,318, Cl. 210-150.000.
Niimi, Masanori: *See*—
Niimi, Tadashi; Niimi, Masanori; and Arimizu, Tsutomu, 4,218,318, Cl. 210-150.000.
Niimi, Tadashi; Niimi, Masanori; and Arimizu, Tsutomu, to Niimi, Tadashi; and Niimi, Masaaki. Process and apparatus for treating and purifying waste water. 4,218,318, Cl. 210-150.000.
Nijman, Willem: *See*—
van Oirschot, Theodorus G. J.; Leswin, Willem J.; Thijs, Petrus J. A.; and Nijman, Willem, 4,218,269, Cl. 148-171.000.
Niles Parts Co., Ltd.: *See*—
Honjo, Kazumi, 4,218,595, Cl. 200-61.540.
Nilsson, Rolf C.: *See*—
Hultman, Bengt G.; and Nilsson, Rolf C., 4,218,284, Cl. 162-38.000.
Nippon Dyeing Machine Mfg. Co., Ltd.: *See*—
Sugimoto, Isao, 4,217,768, Cl. 68-20.000.
Nippon Electric Company, Ltd.: *See*—
Fujisaki, Hisashi, 4,218,665, Cl. 333-165.000.
Inaba, Masao; and Sugimoto, Atsumi, 4,218,705, Cl. 358-149.000.
Ito, Susumu; Nagao, Morimasa; Yamagata, Toshio; and Hayama, Nobuyuki, 4,217,783, Cl. 73-720.000.
Kashigi, Kazuo, 4,218,700, Cl. 358-31.000.
Kashigi, Kazuo; and Koyama, Toshitake, 4,218,710, Cl. 358-183.000.
Kashigi, Kazuo, 4,218,711, Cl. 358-183.000.
Sanguu, Isao, 4,218,639, Cl. 318-6.000.
Nippon Electronics Limited: *See*—
Okude, Kenzo; and Nirei, Koji, 4,217,786, Cl. 74-1.0SS.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,217,804, Cl. 84-1.030.
Nippon Kayaku Kabushiki Kaisha: *See*—
Kooichi, Yoshida; Eitoshi, Shozi; Hiroshi, Ootaki; and Takashi, Terada, 4,218,433, Cl. 424-15.000.
Nippon Kogaku K.K.: *See*—
Utagawa, Ken, 4,218,623, Cl. 250-578.000.
Nippon Oil Company, Ltd.: *See*—
Kawabata, Nobuaki; and Yokoyama, Nobuo, 4,218,263, Cl. 106-270.000.
Yokoyama, Nobuo, 4,218,252, Cl. 106-31.000.
Nippon Steel Corporation: *See*—
Kozima, Yusuke; Matsui, Hideo; and Chikakiyo, Takao, 4,218,201, Cl. 425-7.000.
Nippondenso Co., Ltd.: *See*—
Ohnishi, Shunsaku, 4,218,196, Cl. 417-424.000.
Nirei, Koji: *See*—
Okude, Kenzo; and Nirei, Koji, 4,217,786, Cl. 74-1.0SS.
Nishikawa, Masaji: *See*—
Ishimoto, Osamu; Nishikawa, Masaji; and Yamazaki, Masaru, 4,218,129, Cl. 355-14.0SH.
Nishikawa, Yoshiyasu; and Nakano, Masao, to Kawasaki Jukogyo Kabushiki Kaisha. Flat-bladed fan wheel of diagonal-flow fan. 4,218,190, Cl. 416-186.00R.
Nishimura, Shigeyuki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Kimura, Fumio; Nasu, Rikuo; Sakashita, Nobuyuki; and Nishimura, Shigeyuki, 4,218,237, Cl. 71-94.000.
Nishio, Kanemitsu; Suzuki, Takashi; Uenaga, Toshihiko; and Zega, Fumio, to NGK Spark Plug Co. Ltd.; and Yamahara Hatsudoki Kabushiki Kaisha. Ignition circuit for self-purifying creeping discharge spark plugs. 4,217,873, Cl. 123-653.000.
Nishiyama, Ryuzo; Fujikawa, Kanichi; Kimura, Fumio; Nasu, Rikuo; Sakashita, Nobuyuki; and Nishimura, Shigeyuki, to Ishihara Sangyo Kaisha Limited. Pyridine-2-thio, -2-sulfinyl, and -2-sulfonyl sulfonanilide compounds useful as a herbicidal component. 4,218,237, Cl. 71-94.000.
Nishizuka, Hiroshi: *See*—
Komoriya, Susumu; Morita, Koyo; Nishizuka, Hiroshi; and Majima, Hisashi, 4,218,136, Cl. 355-79.000.
Nissan Motor Company, Limited: *See*—
Ezoe, Mitsuhiko, 4,217,863, Cl. 123-494.000.
Fukasawa, Noburu; and Ishikawa, Masao, 4,218,726, Cl. 362-23.000.
Masaki, Kenji, 4,217,869, Cl. 123-438.000.
Nakajima, Yasuo, 4,217,866, Cl. 123-432.000.
Sugasawa, Fukashi; Marumo, Nagayuki; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,217,795, Cl. 74-858.000.
Nissen, Alexandre: *See*—
Ache, Richard P.; Gartner, Stanley; and Nissen, Alexandre, 4,217,937, Cl. 140-92.100.
Nobue, Michio: *See*—
Konoki, Keizo; and Nobue, Michio, 4,218,397, Cl. 260-555.00A.
Nohmi Bosai Kogyo Co., Ltd.: *See*—
Miyazaki, Tashirou, 4,217,960, Cl. 169-38.000.
Nolan, John T., Jr.; McMahon, Matthew A.; Kessler, Richard V.; and Corbeels, Roger J., to Texaco Inc. Method of charging solids into coal gasification reactor. 4,218,222, Cl. 48-202.000.
Noland, Wayne B. Water circulating device for an animal watering apparatus. 4,218,607, Cl. 219-301.000.
Nomiyama, Yukio: *See*—
Matsuura, Ryo; Segawa, Tomio; Nomiyama, Yukio; Kumada, Yoichi; and Sawada, Hideo, 4,218,376, Cl. 260-314.500.
Noren, Arne I., to Carlsson, Nils Gustav. Apparatus for folding a sheet of material an angle of 180°. 4,218,052, Cl. 270-71.000.
Norris Industries, Inc.: *See*—
Allemann, James G., 4,218,082, Cl. 292-173.000.
Northcutt, William. Security cover for trunk and roof mounted antennae. 4,218,684, Cl. 343-715.000.
Northern Telecom Limited: *See*—
Pound, Thomas C.; and Gouldson, Eric J., 4,218,580, Cl. 174-107.000.
Norton, Richard V., to Ashland Oil, Inc. Method for purification of organic reaction products. 4,218,570, Cl. 585-23.000.
Novex Rt.: *See*—
Nadasy, Miklos; Kovacs, Miklos; Kolcsei, Marton; Vad, Janos; Bartha, Bela; Dobozy, Otto; Mate, Ferenc; and Karacsonyi nee Spindler, Eva, 4,218,234, Cl. 71-86.000.
Novozhilov, Evgeny N.: *See*—
Brusilovsky, Mikhail G.; Krasnokutsky, Valentin P.; Nemtinova, Galina I.; Novozhilov, Evgeny N.; Pekarsky, Viktor A.; Platonova, Svetlana A.; and Tumansky, Alexandr S., 4,218,390, Cl. 260-453.0AB.
Nowacki, Ulrich G., to International Paper Company. Machine for erecting strawberry lug. 4,217,815, Cl. 93-37.00R.
NP Industries, Inc.: *See*—
Newman, Raymond A., 4,217,777, Cl. 73-198.000.
Nuclear Fuel Services, Inc.: *See*—
Biggerstaff, George E., 4,218,430, Cl. 423-632.000.
Nutting, Donald; and Turner, James P. Stemware musical instrument. 4,217,807, Cl. 84-402.000.
Oakes, Clarence D., Jr.: *See*—
Koliba, Melvin J.; Oakes, Clarence D., Jr.; and Napel, Larry P., 4,217,831, Cl. 410-121.000.
Occidental Petroleum Corporation: *See*—
Morey, Booker W., 4,218,310, Cl. 209-214.000.
Occidental Research Corporation: *See*—
Compton, Leslie E., 4,218,309, Cl. 208-208.00R.
O'Connell, J. Garland; and Reynolds, William C., to Ortho Diagnostic, Inc. Automated, self-cleaning fluid sampling apparatus. 4,217,780, Cl. 73-421.00R.
Oda, Isao; and Kaneno, Masayuki, to NGK Insulators, Ltd. Sintered silicon nitride body and a method of producing the same. 4,218,257, Cl. 106-73.500.
Oda, Shinichi; Aoyagi, Shoji; Kuroda, Takio; and Tozaki, Eishun, to Kanzaki Paper Manufacturing Co., Ltd. Recording material and method for the production of the same. 4,218,506, Cl. 428-327.000.
Oettel, Friedrich H., to Eltec Instruments, Inc. Pyroelectric detector having improved suspension means. 4,218,620, Cl. 250-338.000.
Ogawa, Akira; Watanabe, Tatsuo; and Saito, Hideki, to Kokusai Denshin Denwa Kabushiki Kaisha. Space diversity system in TDMA communication system. 4,218,654, Cl. 370-97.000.
Ogawa, Haruo: *See*—
Sugai, Hiroshi; and Ogawa, Haruo, 4,218,216, Cl. 433-104.000.
Ogawa, Nobuhisa: *See*—
Mochida, Ei; and Ogawa, Nobuhisa, 4,218,335, Cl. 252-408.000.
Ogino, Tamio: *See*—
Iwai, Fumio; Kokiso, Masakazu; Koiso, Junichi; and Ogino, Tamio, 4,218,132, Cl. 355-15.000.
Ogino, Yukuo: *See*—
Murahashi, Taro; and Ogino, Yukuo, 4,217,946, Cl. 164-12.000.
O'Hanlon, Edward J. Metal screen solar heat collector wall. 4,217,883, Cl. 126-434.000.
Ohashi, Kanji; Kontani, Kazuo; Uchiyama, Yoshitada; and Motohashi, Kinichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Fuel injection device for compression ignition engine. 4,217,871, Cl. 123-501.000.
Ohloff, Gunther: *See*—
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,218,488, Cl. 426-536.000.
Ohmae, Tsutomu: *See*—
Marumoto, Katsuji; and Ohmae, Tsutomu, 4,218,730, Cl. 363-124.000.
Ohnishi, Shunsaku, to Nippondenso Co., Ltd. Motor fuel pump. 4,218,196, Cl. 417-424.000.
Oiwa, Ruiko: *See*—
Omura, Satoshi; and Oiwa, Ruiko, 4,218,478, Cl. 424-324.000.
Ojanen, Pekka E.: *See*—
Kroger, Keijo K.; and Ojanen, Pekka E., 4,218,174, Cl. 414-786.000.
Oka, Tsumoru: *See*—
Komatsu, Hiroki; and Oka, Tsumoru, 4,218,594, Cl. 200-11.00G.
Okada, Akira: *See*—
Sasaki, Kanji; Suehiro, Tetsuro; and Okada, Akira, 4,218,321, Cl. 210-259.000.
Okada, Mutsumi, to Kabushiki Kaisha Seikosha. Wire printer. 4,218,149, Cl. 400-124.000.
Okazaki, Shigeyoshi: *See*—
Etoh, Yuichi; Kitayama, Akira; Kobayashi, Sadami; and Okazaki, Shigeyoshi, 4,218,428, Cl. 423-242.000.
Oku, Teruo: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,218,374, Cl. 260-245.20R.
Okubo, Toshio: *See*—
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, 4,218,283, Cl. 156-656.000.
Okude, Kenzo; and Nirei, Koji, to Nippon Electronics Limited. Transmission cable for use with an ultrasonic device. 4,217,786, Cl. 74-1.0SS.
Okumura, Takatoshi: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,217,804, Cl. 84-1.030.
Okumura, Tomisaburo: *See*—
Furuta, Yukio; and Okumura, Tomisaburo, 4,218,764, Cl. 365-222.000.
Okuno, Noboru: *See*—
Ushio, Fusao; and Okuno, Noboru, 4,218,696, Cl. 358-8.000.
Okuno, Toshio: *See*—
Kiyonaga, Kingo; Okuno, Toshio; and Tokuda, Kenji, 4,218,243, Cl. 75-124.000.
Olapinski, Hans: *See*—
Dworak, Ulf; and Olapinski, Hans, 4,218,253, Cl. 106-43.000.
Olin Corporation: *See*—
Harris, Frederick J., 4,218,005, Cl. 227-10.000.
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,218,275, Cl. 156-73.100.
Turley, Richard J., 4,218,405, Cl. 260-967.000.
Whalen, John M., 4,218,002, Cl. 226-97.000.
Whitman, Hobart A., III, 4,218,606, Cl. 219-121.00L.
Olinger, Kenneth J.; and Boydelatour, Lester, to Goodyear Aerospace Corporation. Low profile wheel balance weight. 4,218,097, Cl. 301-5.00B.
Olivari, Humbert. Debris picker and bagger. 4,217,672, Cl. 15-79.00A.
Oliver, James E.: *See*—
Chapman, Bruce H.; Oliver, James E.; and Talarico, Lawrence L., 4,217,695, Cl. 33-134.00R.
olleken, Reiner: *See*—
Fiege, Helmut; Wedemeyer, Karlfried; Bauer, Kurt; and olleken, Reiner, 4,218,380, Cl. 260-340.50R.

Olschewski, Wilfred W.; and Stitt, Robert M., to Burr-Brown Research Corp. RF Shield for an electronic component. 4,218,578, Cl. 174-35.00R.

Olthoff, James A.: *See*—
Freese, Gary P.; and Olthoff, James A., 4,217,963, Cl. 172-804.000.

Olympus Optical Co., Ltd.: *See*—
Ishimoto, Osamu; Nishikawa, Masaji; and Yamazaki, Masaru, 4,218,129, Cl. 355-14.05H.
Koshiishi, Kiyozo, 4,218,746, Cl. 364-571.000.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, 4,218,135, Cl. 355-72.000.

Omae, Iwao: *See*—
Hara, Shigeyoshi; and Omae, Iwao, 4,218,247, Cl. 430-78.000.

Omura, Satoshi; and Oiwa, Ruiko. Trichostatin as an antiprotozoal agent. 4,218,478, Cl. 424-324.000.

Onda, Yuzi: *See*—
Saito, Masao; Mizuno, Kinichi; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,218,398, Cl. 260-561.00R.

Oppenlaender, Knut: *See*—
Daubach, Ewald; Herrmann, Manfred; Oppenlaender, Knut; and Stork, Karl, 4,218,218, Cl. 8-550.000.

Orr, James E., to Visual Sales Corporation. Slide viewing apparatus. 4,218,118, Cl. 353-110.000.

Ortho Diagnostic, Inc.: *See*—
O'Connell, J. Garland; and Reynolds, William C., 4,217,780, Cl. 73-421.00R.

Ortiz, Carlos E.: *See*—
Evans, James M.; and Ortiz, Carlos E., 4,218,356, Cl. 260-29.6TA.

Osendorf, Richard J.: *See*—
Lidstone, James E.; and Osendorf, Richard J., 4,218,223, Cl. 55-1.000.

Otsuka, Hisao: *See*—
Ikezaki, Muneyoshi; Otsuka, Hisao; Iwai, Hajime; Inamasu, Masanori; and Morita, Takashi, 4,218,479, Cl. 424-330.000.

Otten, Hans-Gunter: *See*—
Wolfrum, Gerhard; Klauke, Erich; and Otten, Hans-Gunter, 4,218,373, Cl. 260-198.000.

Outboard Marine Corporation: *See*—
Donohue, James A., 4,217,796, Cl. 74-860.000.

Owens-Illinois, Inc.: *See*—
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,218,632, Cl. 313-218.000.

Owens, Milton L. Surgical sling for positioning a harvested kidney during surgical reattachment. 4,217,890, Cl. 128-1.00R.

Oya, Akiyoshi: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,217,804, Cl. 84-1.030.

Ozawa, Yasutomo: *See*—
Kayukawa, Naoyuki; and Ozawa, Yasutomo, 4,218,629, Cl. 310-11.000.

Pacansky, Thomas J.; and Amidon, Alan B., to Xerox Corporation. Process for preparing waterless printing masters. 4,218,514, Cl. 428-447.000.

Palamountain, Bruce F., to Ford Motor Company. Rearview mirror assembly. 4,218,037, Cl. 248-481.000.

Pallmann KG Maschinenfabrik: *See*—
Pallmann, Wilhelm, 4,218,024, Cl. 241-188.00R.

Pallmann, Wilhelm, to Pallmann KG Maschinenfabrik. Adjusting device for the cutting blades of a cutting tool. 4,218,024, Cl. 241-188.00R.

Palma, James D., to General Motors Corporation. Electromagnetic fuel injector. 4,218,021, Cl. 239-585.000.

Palmer, Douglas E.: *See*—
Phillips, David J.; Jones, David T.; and Palmer, Douglas E., 4,218,490, Cl. 426-549.000.

Panov, Alexandr P.; and Salmin, Anatoly P. Apparatus for measuring the intensity and direction of external magnetic fields including power supply and recording units having respective semi-conductor devices. 4,218,652, Cl. 324-253.000.

Papadofrangakis, Emmanuel; and Engeler, William E., to General Electric Company. Directional detection of blood velocities in an ultrasound system. 4,217,909, Cl. 128-663.000.

Park, Sang M.: *See*—
Payne, David A.; and Park, Sang M., 4,218,723, Cl. 361-321.000.

Parker, Norman W.; and Hilbert, Francis H., to Motorola, Inc. Compatible AM stereo broadcast system. 4,218,586, Cl. 179-1.0GS.

Parker, Robert R., to Bell & Howell Company. Changeover control arrangement for projection apparatus. 4,218,115, Cl. 352-7.000.

Parrack, Alvin L.; Lunsford, Delbert R.; and Mikita, Ronald A., to Texaco Inc. Method of seismic wave amplitude normalization. 4,218,766, Cl. 367-47.000.

Parsons, Ward H. Method of and apparatus for loading a floating vessel with flowable solids. 4,218,168, Cl. 414-139.000.

Pascal, Robert A. Molded heavy duty wheel. 4,217,944, Cl. 152-323.000.

Pask, George, to Rolls-Royce Limited. Sealing means for bladed rotor for a gas turbine engine. 4,218,189, Cl. 416-174.000.

Paul, Jill H., to Mobil Oil Corporation. Ketone insecticides. 4,218,468, Cl. 424-282.000.

Paulsen, Hans; Stadler, Peter; and Iodter, Polkhard, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of garamine and garamine derivatives. 4,218,561, Cl. 536-17.00R.

Pauze, Denis R., to General Electric Company. Coating compositions. 4,218,550, Cl. 525-437.000.

Payne, David A.; and Park, Sang M., to University of Illinois Foundation. Heterophasic ceramic composition. 4,218,723, Cl. 361-321.000.

Payton, Hugh W. Above-the-knee cast. 4,217,893, Cl. 128-89.00R.

Pearce, Arnold P., to Flameless Furnaces Ltd. Removal of ash from fluidized beds. 4,217,834, Cl. 110-165.00R.

Pearson, Robert J., to National Gypsum Company. Broad knife for drywall corners. 4,217,673, Cl. 15-235.700.

Peddle, Charles I.: *See*—
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mensch, William D., Jr.; Peddle, Charles I.; Schriber, Gene A.; and Wiles, Michael F., 4,218,740, Cl. 364-200.000.

Peffer, John R.: *See*—
Chang, Wen-Hsuan; Peffer, John R.; and Lewarchik, Ronald J., 4,218,355, Cl. 260-29.40R.

Pekarsky, Viktor A.: *See*—
Brusilovsky, Mikhail G.; Krasnokutsky, Valentin P.; Nemtinova, Galina I.; Novozhilov, Evgeny N.; Pekarsky, Viktor A.; Platonova, Svetlana A.; and Tumansky, Alexandr S., 4,218,390, Cl. 260-453.0AB.

Pelousse, Jean A., to S.A. PRB, Societe Anonyme. Safety device for fuses. 4,217,828, Cl. 102-249.000.

Pelt, Thomas E., to Badger Meter, Inc. Flow control composite valve. 4,217,929, Cl. 137-527.800.

Penco, Sergio; Franchi, Giuliano; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Antitumordeoxy-anthracyclines and use thereof. 4,218,440, Cl. 424-180.000.

Pendleton, Robert G.: *See*—
Bondinell, William E.; and Pendleton, Robert G., 4,218,464, Cl. 424-274.000.

Penn Corporation: *See*—
Koeln, Harold E., 4,217,712, Cl. 40-334.000.

Pennsylvania Engineering Corporation: *See*—
Schempp, Eberhard G., 4,218,049, Cl. 266-243.000.

Pennwalt Corporation: *See*—
Mageli, Orville L.; and Swarts, William A., 4,218,548, Cl. 525-387.000.
Sheppard, Chester S.; and MacLeay, Ronald E., 4,218,370, Cl. 260-192.000.

Perfection Manufacturing Company, The: *See*—
Brown, Thomas, 4,217,747, Cl. 56-203.000.

Perkins, Kelly M., to Lockheed Corporation. Microcomputer assisted electrical harness fabrication and testing system. 4,218,745, Cl. 364-489.000.

Perron, Reginald F., to Hubscher Ribbon Corporation Ltd. Shoulder straps. 4,217,906, Cl. 128-510.000.

Perry, Carlos V., Jr.; and Mayer, Robert B. Diverter valve for septic systems. 4,217,933, Cl. 137-625.470.

Perry, Eli, to Monsanto Company. Membrane separation of organics from aqueous solutions. 4,218,312, Cl. 210-22.00C.

Personal Products Company: *See*—
Bradstreet, James A.; and Roller, Judith E., 4,217,901, Cl. 128-290.00R.

Peters, Clifford M., to W-K-M Wellhead Systems, Inc. Pilot valve mechanism for high or low pressure cut-off control. 4,217,934, Cl. 137-625.660.

Peterson, Dean M.: *See*—
Mack, John C., Jr.; Peterson, Dean M.; and Honeywell Inc., 4,218,421, Cl. 422-66.000.

Petroleum Recovery Institute: *See*—
Sigmund, Phillip M.; Lee, Jong I.; and Fosti, James E., 4,217,955, Cl. 166-252.000.

Petrucci, Pasquale M.: *See*—
Baxter, Robert, Jr.; Antoci, Frank J.; Tynes, William J., III; Petrucci, Pasquale M.; and Martin, George F., 4,218,610, Cl. 235-92.0PC.

Peuker, Gunther: *See*—
Bohm, Manfred; and Peuker, Gunther, 4,218,679, Cl. 343-6.50R.

Pfizer Inc.: *See*—
Barnish, Ian T.; Cross, Peter E.; and Danilewicz, John C., 4,218,474, Cl. 424-319.000.

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Bowling, James A., 4,217,694, Cl. 33-125.00A.

Philipp, Warren H.; May, Charles E.; Hsu, Li-Chen; and Sheibley, Dean W., to United States of America, National Aeronautics and Space Administration. Method of cross-linking polyvinyl alcohol and other water soluble resins. 4,218,280, Cl. 156-272.000.

Phillips, David J.; Jones, David T.; and Palmer, Douglas E., to Viscose Group Limited. Functional proteins. 4,218,490, Cl. 426-549.000.

Phillips, John R.; and Jacobson, Richard N., to Phillips, John R. Hot bed desalination process. 4,218,290, Cl. 203-11.000.

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Drake, Charles A.; and Crouch, Willie W., 4,218,394, Cl. 260-465.80R.
McKay, Dwight L., 4,218,337, Cl. 252-411.00R.
Reber, Martin R.; and Kitchen, Leland G., 4,218,194, Cl. 417-364.000.
Stewart, William S., 4,218,191, Cl. 417-19.000.
Walker, Darrell W.; Hogan, Robert J.; and Farha, Floyd, Jr., 4,218,343, Cl. 252-435.000.
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Pickens, Jay W., to D/FW Plastics. Bracket for supporting a roll of material. 4,218,028, Cl. 242-55.200.

Pickett, Oscar A., Jr.: *See*—
Ridgway, James S.; Chapman, Richard D.; Moedritzer, Kurt; and Pickett, Oscar A., Jr., 4,218,365, Cl. 260-45.75C.

Piepenhagen, John H. K.: *See*—
Vanecek, Michael J.; Piepenhagen, John H. K.; Neale, Michael J.; Lasiter, Steven M.; and Bailey, Raymond A., 4,218,048, Cl. 266-236.000.
Pike, Roscoe A., to United Technologies Corporation. Tri-substituted, hydrocarbon soluble, chromium compound synthesis. 4,218,385, Cl. 260-408.000.
Pilarski, Klemens: *See*—
Jaromin, Zygmunt; Szymczyk, Boleslaw; Blazewicz, Andrzej; and Pilarski, Klemens, 4,218,095, Cl. 299-87.000.
Pinkow, Gunter K., to Sack GmbH. Continuous casting apparatus. 4,217,950, Cl. 164-426.000.
Pioneer Electronic Corporation: *See*—
Kondo, Minoru, 4,218,774, Cl. 455-249.000.
Pitkanen, Clarence O., to Re-Trac Corporation. Bracket for mounting a rear view mirror on a vehicle. 4,218,036, Cl. 248-475.00B.
Pitroda, Satyan G.; and Min, Byung C., to Wescom Switching, Inc. Method and apparatus for testing tone generators. 4,218,589, Cl. 370-13.000.
Platonova, Svetlana A.: *See*—
Brusilovsky, Mikhail G.; Krasnokutsky, Valentin P.; Nemtinova, Galina I.; Novozhilov, Evgeny N.; Pekarsky, Viktor A.; Platonova, Svetlana A.; and Tumansky, Alexandr S., 4,218,390, Cl. 260-453.0AB.
Plessey, Incorporated: *See*—
Hemming, Leland H., 4,218,683, Cl. 343-703.000.
Plewa, Manfred; Jaschinski, Claus-Dieter; and Meier, Dieter, to Vemag Verdener Maschinen-und Apparatebau GmbH. Sausage loop-forming machine. 4,218,003, Cl. 226-104.000.
Poiesz, Mattheus J.: *See*—
Grendelman, Mannes; Poiesz, Mattheus J.; and van der Kemp, Leo A. A., 4,217,935, Cl. 138-109.000.
Polaroid Corporation: *See*—
Fischer, Richard V., 4,218,117, Cl. 352-72.000.
Kiesel, Kenneth C., 4,218,627, Cl. 307-311.000.
Poletto, John F.; and Bernstein, Seymour, to American Cyanamid Company. Ureylene naphthalene sulfonic acids. 4,218,395, Cl. 260-507.00R.
Pont, Glen W., to Lamb, W. C. Ultrasonic inspection device and method of inspection. 4,217,782, Cl. 73-637.000.
Pool, Dan L. Dispenser for paper roll. 4,218,027, Cl. 242-55.200.
Portilla, Mario, Sr. Contour stitching apparatus for use with a sewing head. 4,217,838, Cl. 112-121.120.
Posselt, Klaus: *See*—
Isaac, Otto; Posselt, Klaus; Uthemann, Horst; and Thiemer, Klaus, 4,218,447, Cl. 424-241.000.
Potter Electric Signal Co.: *See*—
Wilson, Stanley, Jr.; and Borger, Robert M., 4,218,677, Cl. 340-506.000.
Poulo, Louis R., to Bose Corporation. Varying loudspeaker spatial characteristics. 4,218,583, Cl. 179-1.00E.
Poulsen, Soren B., to GW-Sprinkler A/S. Electrically controlled fluid disperser for a fire extinguishing system. 4,217,959, Cl. 169-28.000.
Pound, Thomas C.; and Gouldson, Eric J., to Northern Telecom Limited. Paper pulp insulated cable and method of manufacture. 4,218,580, Cl. 174-107.000.
Pozzan, Bruno. Structure made up of several components particularly for use in classrooms. 4,217,832, Cl. 108-11.000.
PPG Industries, Inc.: *See*—
Allersma, Ties, 4,218,512, Cl. 428-410.000.
Chang, Wen-Hsuan; Peffer, John R.; and Lewarchik, Ronald J., 4,218,355, Cl. 260-29.40R.
Lavanish, Jerome M., 4,218,236, Cl. 71-90.000.
Lemmon, Robert G., Jr.; and Earnest, Melvin F., 4,218,231, Cl. 65-99.00A.
Wilhelm, Richard E., 4,218,232, Cl. 65-106.000.
Pratt, Wayne L.; and King, Paul E., to Avicon Development Group. Fuel flow consumption monitoring system. 4,218,744, Cl. 364-442.000.
Premier Microwave Corporation: *See*—
Snyder, Richard V., 4,218,666, Cl. 333-211.000.
Prenatt, Harlan E.; and Prenatt, Mark E., to said Harlan E. Prenatt; by said Mark E. Prenatt. Convertible snow removing and grass cutting device. 4,217,708, Cl. 37-43.00L.
Prenatt, Mark E.: *See*—
Prenatt, Harlan E.; and Prenatt, Mark E., 4,217,708, Cl. 37-43.00L.
Pressure Science Incorporated: *See*—
Halling, Horace P., 4,218,067, Cl. 277-205.000.
Price, Harold A.; and Wingate, F. Everett. Method and apparatus for producing particulate sulfur. 4,218,411, Cl. 264-8.000.
Printer Associates: *See*—
Matschke, Arthur L., 4,218,148, Cl. 400-124.000.
Procter & Gamble Company, The: *See*—
Logan, Ted J.; Underwood, David C.; and Rheinecker, Tom C., 4,218,386, Cl. 260-415.000.
Production Plus Corporation: *See*—
Davitz, Walter E., 4,217,853, Cl. 118-500.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Brouard, Claude M. H. E.; and Moerel, Claude L. E., 4,218,367, Cl. 260-146.00R.
Brouard, Claude M. H. E.; Moerel, Claude L. E.; and Stiot, Jean-Pierre H., 4,218,369, Cl. 260-157.000.
Prolizenz AG: *See*—
Gyongyos, Ivan; and Bolliger, Martin, 4,217,947, Cl. 164-87.000.
Pu, Lyong S.; and Kamoda, Hitoshi, to Fuji Xerox Co., Ltd. Electrophotographic photosensitive material having a quinocyanine pigment photoconductor. 4,218,529, Cl. 430-78.000.
Pullukat, Thomas J.: *See*—
Hoff, Raymond E.; and Pullukat, Thomas J., 4,218,345, Cl. 252-458.000.
Putt, Ronald A.; and Montgomery, Mark J., to Electric Power Research Institute, Inc. Metal-halogen battery having reduced dendrite growth. 4,218,521, Cl. 429-39.000.
Rabus, Friedrich; and Grather, Gunter, to Robert Bosch GmbH. Multiple spark ignition system for an internal combustion engine. 4,217,872, Cl. 123-596.000.
Rabus, Friedrich: *See*—
Grather, Gunter; Rabus, Friedrich; and Stuible, Ewald, 4,217,868, Cl. 123-416.000.
Radisch, Helmer, to Saint-Gobain Industries. Safety glazing containing support for attachment of labels. 4,218,500, Cl. 428-78.000.
Radovan, Chedomir; and Schulte, Rudolf R., to Heyer-Schulte Corporation, a part interest. Flap development device and method of progressively increasing skin area. 4,217,889, Cl. 128-1.00R.
Rail Bearing Service: *See*—
Van Sickle, Robert J., 4,217,698, Cl. 33-174.00R.
Van Sickle, Robert J., 4,217,733, Cl. 51-103.00R.
Ramesohl, Hubert: *See*—
Herchenbach, Horst; and Ramesohl, Hubert, 4,218,209, Cl. 432-14.000.
Ramsay, Charles F., to A & E Plastik Pak Co., Inc. Display sign. 4,217,714, Cl. 40-549.000.
Rand, Bobby J. Multipurpose cleaning device. 4,217,671, Cl. 15-24.000.
Rank Organisation Limited, The: *See*—
Whitehouse, David J.; and Jungles, John, 4,218,144, Cl. 356-446.000.
Rapidsyn Co.: *See*—
Morreale, Anthony P., 4,217,690, Cl. 29-596.000.
Rarey, Kenneth W., to Continental Group, Inc., The. Electrostatic repair coating. 4,218,493, Cl. 427-27.000.
Raschepkin, Konstantin E.: *See*—
Ikhsanov, Deviz F.; Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; and Galjuk, Vasily K., 4,218,044, Cl. 254-93.00R.
Rasmussen, Harry R.; and Kimzey, Gene A., to Crest Industries, Inc. Key telephone system having automatic exclusion circuit for line privacy. 4,218,590, Cl. 179-99.00E.
Rasmussen, Jerald K., to Minnesota Mining and Manufacturing Company. Impact resistant, thermoplastic polyamides. 4,218,351, Cl. 260-18.00N.
Rast, Robert M., to RCA Corporation. Hangup corrector useful in locked loop tuning system. 4,218,657, Cl. 455-182.000.
Ray, Ralph D.: *See*—
Hitchcock, Melvin L.; Ray, Ralph D.; and Felder, Eugene H., Jr., 4,218,669, Cl. 335-258.000.
Ray, Robert A., to Beckman Instruments, Inc. Determination of enzyme substrate concentration. 4,218,535, Cl. 435-12.000.
RCA Corporation: *See*—
Barkow, William H.; and Shisler, Robert W., 4,218,667, Cl. 335-212.000.
Bart, Theodor E.; and Mills, Ronald A., 4,218,698, Cl. 358-22.000.
Bloom, Allen; and Bartolini, Robert A., 4,218,689, Cl. 346-135.100.
Breithaupt, David W., 4,218,638, Cl. 315-397.000.
Cardinal, Rene E., 4,217,683, Cl. 29-25.130.
Dischert, Robert A.; and Libbey, Robert L., 4,218,699, Cl. 358-29.000.
Harford, Jack R., 4,218,708, Cl. 358-178.000.
Ipri, Alfred C., 4,217,688, Cl. 29-571.000.
Nelson, Howard T., 4,218,214, Cl. 432-258.000.
Rast, Robert M., 4,218,657, Cl. 455-182.000.
Re-Trac Corporation: *See*—
Pitkanen, Clarence O., 4,218,036, Cl. 248-475.00B.
Rebel, Herbert; and Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Detachable gap covering on cylinders of printing presses. 4,217,824, Cl. 101-375.000.
Reber, Martin R.; and Kitchen, Leland G., to Phillips Petroleum Company. Vapor pressure control system for gas turbine fuel. 4,218,194, Cl. 417-364.000.
Redd, Lewis M., Jr., to Sandoz, Inc. Method of producing multicolor dyeings. 4,218,217, Cl. 8-478.000.
Redden, Robert F.: *See*—
Charlton, Thomas L.; and Redden, Robert F., 4,218,425, Cl. 423-87.000.
Reed, Lloyd D.; Howat, M. Ross; and Ulrichsen, John E., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Thermographic areameter. 4,218,707, Cl. 358-113.000.
Reekstin, John P.; and Glass, Howard L., to Rockwell International Corporation. X-ray lithographic mask using rare earth and transition element compounds and method of fabrication thereof. 4,218,503, Cl. 428-195.000.
Reever, Kenneth P.: *See*—
Giannaula, Joseph J.; and Reever, Kenneth P., 4,218,110, Cl. 339-154.00A.
Reichstadt, Hans U. Roof window. 4,217,732, Cl. 49-153.000.
Reid, Kenneth H.: *See*—
Finn, Bernard J.; Steger, Charles B.; and Reid, Kenneth H., 4,218,033, Cl. 242-107.40A.
Reider, Samuel B., to General Motors Corporation. Elliptical airblast nozzle. 4,218,020, Cl. 239-406.000.

Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, to Firmenich SA. Use of spirane derivatives to improve the organoleptic properties of foodstuffs, feedstuffs, or beverages. 4,218,488, Cl. 426-536.000.

Renzi, Alfred A.: *See—*
Wagner, Eugene R.; Matthews, Donald P.; and Renzi, Alfred A., 4,218,475, Cl. 424-319.000.

Research Corporation of the University of Hawaii, The: *See—*
Casciano, Frederick M., 4,217,709, Cl. 37-62.000.

Ressler, Marc A.: *See—*
Buscher, David J.; Ellingwood, Robert G.; and Ressler, Marc A., 4,218,737, Cl. 364-493.000.

Reynolds, William C.: *See—*
O'Connell, J. Garland; and Reynolds, William C., 4,217,780, Cl. 73-421.00R.

Rheinecker, Tom C.: *See—*
Logan, Ted J.; Underwood, David C.; and Rheinecker, Tom C., 4,218,386, Cl. 260-415.000.

Rhodes, Tony: *See—*
Flicker, Alcwyn; Gay, Derek J.; Rhodes, Tony; and Sweet, Roger H., 4,217,726, Cl. 46-120.000.

Ribka, Joachim: *See—*
Nagl, Gert; Ribka, Joachim; Dickmanns, Heinz; and Gotsmann, Ulrich, 4,218,219, Cl. 8-652.000.

Richter Gedeon Vegyeszeti Gyar Rt: *See—*
Solyom, Sandor; Toldy, Lajos; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,218,446, Cl. 424-241.000.

Ricoh Company, Ltd.: *See—*
Fujii, Tadashi, 4,218,691, Cl. 346-153.000.
Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,128, Cl. 355-14.0SH.
Satomi, Toyokazu; Koizumi, Yutaka; Miyakawa, Seiichi; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,130, Cl. 355-14.00R.

Riddel, John W., to General Motors Corporation. Position feedback valve assembly and servo motor incorporating same. 4,217,969, Cl. 180-175.000.

Riddersholm, Viggo M. Quick action collet lock. 4,218,165, Cl. 409-225.000.

Ridge, George W.: *See—*
Cicci, George B.; Markert, Leo A.; Ridge, George W.; and Lutz, Austin W., Jr., 4,217,746, Cl. 56-14.400.

Ridgway, James S.; Chapman, Richard D.; Moedritzer, Kurt; and Pickett, Oscar A., Jr., to Monsanto Company. Polyamide fibers having improved ozone fading resistance. 4,218,365, Cl. 260-45.75C.

Rieck, Gerald C.: *See—*
Abu-Akeel, Abdulhadi K.; Barrowman, Thomas; and Rieck, Gerald C., 4,218,166, Cl. 414-1.000.

Riley, George R.: *See—*
Canty, Michael P.; Caudy, Don W.; Hackman, Donald J.; Harris, Jeremy M.; Mowery, Robert W.; Riley, George R.; and Trott, Beverly D., 4,217,717, Cl. 42-1.00R.

Ripley, Wade D. Adjustable hoop clamp for tanks or the like. 4,217,990, Cl. 217-95.000.

Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. Peptide which inhibits gonadal function. 4,218,439, Cl. 424-177.000.

Rivier, Jean E. F.: *See—*
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,218,439, Cl. 424-177.000.

Rivinius, Theodore. Rotating powered step. 4,217,971, Cl. 182-2.000.

Roach, Allan G.: *See—*
Langer, Salomon Z.; and Roach, Allan G., 4,218,466, Cl. 424-275.000.

Robbins, John D.: *See—*
Netravali, Arun N.; and Robbins, John D., 4,218,703, Cl. 358-136.000.
Netravali, Arun N.; and Robbins, John D., 4,218,704, Cl. 358-136.000.

Robel, Robb W. Cohesion type turbine. 4,218,177, Cl. 415-90.000.

Robert Bosch GmbH: *See—*
Grather, Gunter; Rabus, Friedrich; and Stuible, Ewald, 4,217,868, Cl. 123-416.000.
Rabus, Friedrich; and Grather, Gunter, 4,217,872, Cl. 123-596.000.
Seibicke, Horst; and Ursel, Eckhard, 4,218,018, Cl. 239-284.00A.
Sohner, Gerhard; and Ruf, Walter, 4,217,874, Cl. 123-594.000.

Robertshaw Controls Company: *See—*
Brakebill, Harold G., 4,218,040, Cl. 251-28.000.
Kelly, Samuel T., 4,217,928, Cl. 137-495.000.

Robertson, Louis, to Chicago Bridge & Iron Company. Valved or progressively opening sparger with rigid upper seat. 4,218,407, Cl. 261-64.00R.

Robertsson, Hans R., to Saab-Scania Aktiebolag. Method and means for determining positions of reflectors with fan-shaped beams. 4,218,138, Cl. 356-152.000.

Robillard, Robert J., to General Electric Company. Caulking tube with an improved seal to retard the passage of air. 4,217,995, Cl. 222-327.000.

Robin, Allen M.; and Catena, Americo R., to Texaco Inc. Quench ring and dip tube assembly for a reactor vessel. 4,218,423, Cl. 422-207.000.

Robin, Allen M.: *See—*
Crouch, William B.; Fabiero nee Posadas, Carolina Z.; and Robin, Allen M., 4,218,326, Cl. 252-8.55D.

Robinson, John W.: *See—*
Wilcox, Brian N.; and Robinson, John W., 4,217,801, Cl. 84-1.010.

Rockwell International Corporation: *See—*
Brinegar, Bill W.; and Haines, John W., 4,218,706, Cl. 358-172.000.
Cagle, George C., 4,218,769, Cl. 375-95.000.
Chen, Thomas T., 4,218,761, Cl. 365-4.000.
Hogge, Charles R., Jr., 4,218,771, Cl. 375-120.000.
Maddox, Roy L., Jr., 4,218,267, Cl. 148-1.500.
Reekstin, John P.; and Glass, Howard L., 4,218,503, Cl. 428-195.000.
Schach, Robert E.; and Van Eerden, Richard L., 4,218,092, Cl. 297-367.000.

Rockwell-Rimoldi S.p.A.: *See—*
Anghinoni di Luigi, Ottorino, 4,217,842, Cl. 112-322.000.

Roder, Hugh H.; and Baum, James P., to Boise Cascade Corporation. Controlled depth scoring tool. 4,217,693, Cl. 30-292.000.

Rogers, Lloyd W., Jr., to General Motors Corporation. Passive seat belt system having lap belt lifter. 4,218,075, Cl. 280-804.000.

Rohner, Joachim; Mauries, Reinhard; and Zumfeld, Heinz, to W. Schlafhorst & Co. Method and apparatus for joining textile threads. 4,217,749, Cl. 57-261.000.

Rohrbach, Ronald P.; and Lester, George W., to UOP Inc. Preparation of support matrices for immobilized enzymes. 4,218,363, Cl. 260-42.140.

Roland Corporation: *See—*
Sakai, Tadao; and Tamada, Yukio, 4,217,806, Cl. 84-1.030.
Tamada, Yukio, 4,217,805, Cl. 84-1.030.

Rolla, Gunnar; and Winter, Michael R. C., to Imperial Chemical Industries Limited. Method of cleaning teeth and compositions for use in such method. 4,218,434, Cl. 424-49.000.

Roller, Judith E.: *See—*
Bradstreet, James A.; and Roller, Judith E., 4,217,901, Cl. 128-290.00R.

Rolls-Royce Limited: *See—*
Barry, Brian; and Artt, David W., 4,218,179, Cl. 415-114.000.
Pask, George, 4,218,189, Cl. 416-174.000.

Roman, Robert F.: *See—*
Mirtich, Michael J., Jr.; Sovey, James S.; and Roman, Robert F., 4,218,633, Cl. 313-362.000.

Roman, Steven A., to Shell Oil Company. Preparation of 2,2-dimethyl-3-((oxyimino)methyl)cyclopropanecarboxylic acids. 4,218,402, Cl. 260-546.000.

Romand, Paul: *See—*
Coindet, Jacques; and Romand, Paul, 4,218,173, Cl. 414-730.000.

Romano, Ugo; Tesei, Renato; Cipriani, Gioacchino; and Micucci, Lidio, to Anic, S.p.A. Method for the preparation of esters of carbonic acid. 4,218,391, Cl. 260-463.000.

Root, Steven A. Weather forecasting apparatus. 4,218,755, Cl. 364-900.000.

Rosenberger, Roy R., to Nalco Chemical Company. Apparatus for diluting concentrated polymer solutions. 4,218,147, Cl. 366-162.000.

Rossi, Pietro P.: *See—*
Siclari, Francesco; and Rossi, Pietro P., 4,218,384, Cl. 260-404.000.
Siclari, Francesco; Rossi, Pietro P.; and De Gaetano, Mario, 4,218,399, Cl. 260-583.00P.

Rothberg, Henry M., to Laticrete International, Inc. Hydraulic cement adhesive compositions. 4,218,258, Cl. 106-93.000.

Rouse, John W., to American Can Company. Incremental strip feeder. 4,218,004, Cl. 226-149.000.

Roussel Uclaf: *See—*
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,218,375, Cl. 260-330.300.

Rowe, David W.: *See—*
McPherson, William E.; and Rowe, David W., 4,218,184, Cl. 416-17.000.

Royal Textile Mills, Inc.: *See—*
Atwater, Mark V.; and Atwater, W. David, 4,217,905, Cl. 128-498.000.

Rubin, Llewellyn A.: *See—*
Fowler, James C.; Rubin, Llewellyn A.; and Still, William L., 4,218,678, Cl. 343-5.0FT.

Ruether, Peter G.: *See—*
Elder, J. Mark; and Ruether, Peter G., 4,218,587, Cl. 370-81.000.

Ruf, Walter: *See—*
Sohner, Gerhard; and Ruf, Walter, 4,217,874, Cl. 123-594.000.

Ruff, Stanley L. Container lid convertible into spoon. 4,218,010, Cl. 229-43.000.

Ruker, Otto, to C. Reichert Optische Werke, AG. Photometer microscope for microphotometer scanning of fine specimen structures. 4,218,112, Cl. 350-8.000.

Runderkamp, Bernardus J.: *See—*
Schaper, Lambert; Runderkamp, Bernardus J.; Sie, Swan T.; and Spakman, Nicoline W., 4,218,388, Cl. 260-449.00R.

Rutgerswerke Aktiengesellschaft: *See—*
Finger, Carl, 4,218,400, Cl. 568-321.000.

Ryan, Daniel J.: *See—*
Hartmann, Wilhelm U.; Augustine, Larry C.; and Ryan, Daniel J., 4,218,324, Cl. 210-493.00R.

Saab-Scania Aktiebolag: *See—*
Robertsson, Hans R., 4,218,138, Cl. 356-152.000.

Sacco, John A.: *See—*
DiGiacomo, Hector L.; and Sacco, John A., 4,218,526, Cl. 429-138.000.

Sack GmbH: *See—*
Langen, Hans, 4,218,159, Cl. 407-25.000.
Pinkow, Gunter K., 4,217,950, Cl. 164-426.000.

Sagae, Kyuta; Tanabe, Susumu; and Kamogawa, Hiroshi, to Terumo Corporation. Intravascular catheter. 4,217,895, Cl. 128-214.400.

Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, to Hitachi, Ltd. Method for fabricating semiconductor device and etchant for polymer resin. 4,218,283, Cl. 156-656.000.
Saino, Joseph N. Fire door. 4,217,731, Cl. 49-169.000.
Saint-Gobain Industries: *See*—
Radisch, Helmer, 4,218,500, Cl. 428-78.000.
Saito, Hideki: *See*—
Ogawa, Akira; Watanabe, Tatsuo; and Saito, Hideki, 4,218,654, Cl. 370-97.000.
Saito, Masao; Mizuno, Kinichi; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, to Mitsubishi Gas Chemical Company, Inc. Process for producing dimethylformamide. 4,218,398, Cl. 260-561.00R.
Saito, Motoyuki, to Citizen Watch Co., Ltd. Pushbutton. 4,218,601, Cl. 200-159.00R.
Saito, Takashi: *See*—
Tanaka, Hiroshi; and Saito, Takashi, 4,218,246, Cl. 430-126.000.
Sakai, Tadao; and Tamada, Yukio, to Roland Corporation. Automatic rhythm generating method and apparatus in electronic musical instrument. 4,217,806, Cl. 84-1.030.
Sakamoto, Shigeru; Moriyama, Hiroyuki; Fujii, Ryosuke; Ishii, Toshiharu; Sugawara, Isao; and Kikuchi, Minoru, to Taisei Corporation. Ice making equipment. 4,217,762, Cl. 62-132.000.
Sakashita, Nobuyuki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Kimura, Fumio; Nasu, Rikuo; Sakashita, Nobuyuki; and Nishimura, Shigeyuki, 4,218,237, Cl. 71-94.000.
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Isozaki, Shin; and Sakurai, Kanji, 4,218,714, Cl. 360-99.000.
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Sloan, Leila C. Electric resist wax pen. 4,218,152, Cl. 401-2.000.
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Siclari, Francesco; Rossi, Pietro P.; and De Gaetano, Mario, 4,218,399, Cl. 260-583.00P.
Snyder, John L.; and Johnson, Paul D., to SCM Corporation. Process for the manufacture of metal joining paste. 4,218,248, Cl. 106-1.120.
Snyder, Richard V., to Premier Microwave Corporation. Dual mode band rejection filter. 4,218,666, Cl. 333-211.000.
Sobbe, Donald A. Aerial bomb simulating device for model aircraft. 4,218,064, Cl. 273-428.000.
Societe Anonyme D.B.A.: *See*—
Come, Philippe, 4,217,922, Cl. 137-265.000.
Johns, Christopher; and Le Deit, Gerard, 4,217,973, Cl. 188-1.00A.
Kervogoret, Gilbert, 4,218,100, Cl. 303-119.000.
Societe Anonyme de Droit Francais, Poclain: *See*—
Guinot, Gabriel L., 4,218,171, Cl. 414-694.000.
Societe Anonyme dite: les Cables de Lyon: *See*—
Jacquemart, Patrick, 4,218,417, Cl. 264-275.000.
S.A. PRB, Societe Anonyme: *See*—
Pelousse, Jean A., 4,217,828, Cl. 102-249.000.
Societe d'Utilisation Scientifique et Industrielle du Froid - Usifroid: *See*—
Bex, Jean Pierre; and Mantel, Claude, 4,217,665, Cl. 3-1.500.
Societe Europeenne des Produits Refractaires: *See*—
Kiehl, Jean-Pierre; and Clavaud, Bernard A., 4,218,254, Cl. 106-44.000.
Societe Nationale Industrielle: *See*—
Brocard, Francois; Denizot, Andre; and Dif, Marcel, 4,218,702, Cl. 358-109.000.
Sohar, Paul: *See*—
Love, George M.; Sohar, Paul; and Weinstock, Leonard M., 4,218,563, Cl. 544-21.000.
Sohner, Gerhard; and Ruf, Walter, to Robert Bosch GmbH. Ignition system using a Wiegand wire. 4,217,874, Cl. 123-594.000.
Solartrap, Inc.: *See*—
Bowles, Vernon O., 4,217,885, Cl. 126-444.000.
Soltis, Frank G.: *See*—
Hoffman, Roy L.; Mitchell, Glen R.; and Soltis, Frank G., 4,218,743, Cl. 364-200.000.
Solyom, Sandor; Toldy, Lajos; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, to Richter Gedeon Vegyeszeti Gyar Rt. Substituted steroid-spiro-oxazolidinone derivatives and a process for the preparation thereof. 4,218,446, Cl. 424-241.000.
Sonoda, Noriaki; and Koike, Kiyoshi, to (Nihon Rajiecta Kabushiki Kaisha. Parallel flow type evaporator. 4,217,953, Cl. 165-44.000.
Sovey, James S.: *See*—
Mirtich, Michael J., Jr.; Sovey, James S.; and Roman, Robert F., 4,218,633, Cl. 313-362.000.
Spakman, Nicoline W.: *See*—
Schaper, Lambert; Runderkamp, Bernardus J.; Sie, Swan T.; and Spakman, Nicoline W., 4,218,388, Cl. 260-449.00R.
Spannlang, Ronald: *See*—
Engel, Kurt; and Spannlang, Ronald, 4,217,951, Cl. 164-448.000.
Sparf, Bengt A.: *See*—
Joensson, Aake N.; Kempe, Tomas G.; Mikiver, Lembit; and Sparf, Bengt A., 4,218,472, Cl. 424-316.000.
Spencer Wright Industries, Inc.: *See*—
Scott, Jimmie D., 4,217,836, Cl. 112-79.00R.
Sperber, Werner: *See*—
Viehrig, Wolfgang; and Sperber, Werner, 4,218,123, Cl. 354-310.000.
Spevack, Jerome S., to Deuterium Corporation. Removal of sulfide contaminants from carbonate waters with production of CO_2-free H_2S. 4,218,431, Cl. 423-563.000.
Spoor, Martin, to Bofors America, Inc. Erasable-foil-resistance compensation of strain gage transducers. 4,217,785, Cl. 73-766.000.
Spresser, Howard L.; and Miller, Darrell W., to Advocart, Inc. Advertising dispay unit for shopping carts. 4,217,711, Cl. 40-308.000.
Spribag Aktiengesellschaft: *See*—
Egli, Ernst; Bombelli, Nino; and Misteli, Max, 4,218,050, Cl. 266-281.000.
SR Engineering: *See*—
Hitchcock, Melvin L.; Ray, Ralph D.; and Felder, Eugene H., Jr., 4,218,669, Cl. 335-258.000.
SRI International: *See*—
DeGraw, Joseph I.; Lawson, John A.; Johnson, Howard L.; Loew, Gilda H.; and Berkowitz, Donald A., 4,218,454, Cl. 424-260.000.
Grange, Edward W.; Henry, David W.; and Lee, William W., 4,218,465, Cl. 424-275.000.
Stadler, Peter: *See*—
Paulsen, Hans; Stadler, Peter; and Iodter, Polkhard, 4,218,561, Cl. 536-17.00R.
Staehler, Glenn E.: *See*—
LaBelle, Gerald G.; and Staehler, Glenn E., 4,218,534, Cl. 435-5.000.
Stahlheber, Benjamin L.: *See*—
Shemitz, Sylvan R.; and Stahlheber, Benjamin L., 4,218,727, Cl. 362-297.000.
Stal-Laval Turbin AB: *See*—
Wikstrom, Rolf, 4,218,180, Cl. 415-138.000.
Stalker, Neil J., to F. Jos. Lamb Company. Precise pallet locating and clamping arrangement for workpiece transfer mechanism. 4,217,978, Cl. 198-345.000.
Stamberg, Jiri: *See*—
Sevcik, Stanislav; Trekoval, Jiri; Holata, Jan; and Stamberg, Jiri, 4,218,552, Cl. 526-173.000.
Standard Oil Company: *See*—
Dolhyj, Serge R.; and Velenyi, Louis J., 4,218,572, Cl. 585-400.000.
Milberger, Ernest C.; Dolhyj, Serge R.; and Bremer, Noel J., 4,218,382, Cl. 260-346.750.

Standard Oil Company (Indiana): *See—*
Chao, Kwei C.; McCarthy, Edward F.; and McConaghy, George A., 4,218,481, Cl. 426-60.000.
Kinkade, Robert R., 4,218,765, Cl. 367-45.000.
Vasalos, Iacovos A., 4,218,344, Cl. 252-455.00Z.

Stange, Karl: *See—*
Hahn, Klaus; Walter, Manfred; Stange, Karl; and Weber, Heinz, 4,218,511, Cl. 428-407.000.

Stange, Klaus K., to Xerox Corporation. Paper web buffer system. 4,218,026, Cl. 242-55.000.

Stark, Gerd, to Dyna-Plastik Werke GmbH. Wedge-shaped securing element for roller blind assembly. 4,217,945, Cl. 160-236.000.

Stastny, Joseph D. Workpiece holding fixture. 4,218,051, Cl. 269-131.000.

Stauffer Chemical Company: *See—*
Hayati, Hossein; and Flasch, John R., 4,218,354, Cl. 260-29.20M.

Staver, Bernard B.: *See—*
Staver, Peter J., 4,217,908, Cl. 128-643.000.

Staver, Margaret: *See—*
Staver, Peter J., 4,217,908, Cl. 128-643.000.

Staver, Peter J., to Staver, Bernard B.; and Staver, Margaret, part interest to each. Vector lead apparatus and methods of constructing and utilizing same. 4,217,908, Cl. 128-643.000.

Stead, Emmett T.; and Kennedy, Ray A., to Micromatic, Inc. Bacon processed product. 4,218,492, Cl. 426-646.000.

Steelcase Inc.: *See—*
Garn, Larry W., 4,218,599, Cl. 200-159.00R.

Steger, Charles B.: *See—*
Finn, Bernard J.; Steger, Charles B.; and Reid, Kenneth H., 4,218,033, Cl. 242-107.40A.

Steinberga, Arvey Z.; Taylor, Ray H.; and Whalen, James T., to GTE Products Corporation. Telephone analyzer for detection of clandestine devices. 4,218,592, Cl. 179-175.20D.

Steiner, Efroim: *See—*
Godfroid, Jean-Jacques; and Steiner, Efroim, 4,218,473, Cl. 424-317.000.

Stekar, Jurij: *See—*
Brock, Norbert; and Stekar, Jurij, 4,218,471, Cl. 424-315.000.

Stendel, Wilhelm: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,218,469, Cl. 424-304.000.

Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, to Leybold-Heraeus GmbH & Co. KG. Method for the production of high-purity metal powder by means of electron beam heating. 4,218,410, Cl. 264-8.000.

Stetson, Earl W., to General Electric Company. Heat transfer system for voltage surge arresters. 4,218,721, Cl. 361-117.000.

Stevens, Rex R.: *See—*
Meyer, Victor E.; and Stevens, Rex R., 4,218,516, Cl. 428-537.000.

Stewart, Alistair C.: *See—*
Jones, Newlyn; and Stewart, Alistair C., 4,218,286, Cl. 162-164.00R.

Stewart, William S., to Phillips Petroleum Company. Multi-constraint control of a compression system. 4,218,191, Cl. 417-19.000.

Still, William L.: *See—*
Fowler, James C.; Rubin, Llewellyn A.; and Still, William L., 4,218,678, Cl. 343-5.0FT.

Stiot, Jean-Pierre H.: *See—*
Brouard, Claude M. H. E.; Moerel, Claude L. E.; and Stiot, Jean-Pierre H., 4,218,369, Cl. 260-157.000.

Stitt, Robert M.: *See—*
Olschewski, Wilfred W.; and Stitt, Robert M., 4,218,578, Cl. 174-35.00R.

Stobbe, Alan W.: *See—*
Fellman, Jack D.; Kaufman, Harvey L.; and Stobbe, Alan W., 4,218,292, Cl. 204-55.00R.

Stockinger, Friedrich; Eldin, Sameer H.; and Lohse, Friedrich, to Ciba-Geigy Corporation. Metal salt/amine complexes. 4,218,377, Cl. 260-326.220.

Stockton, Raymond F. Terrestrial magnetism responsive device and method for using north or south seeking magnets in both north and south headings. 4,217,699, Cl. 33-355.00R.

Stonner, Hans-Martin; and Wiesner, Paul, to Metallgesellschaft Aktiengesellschaft. Process of scrubbing polyvalent phenols from gas. 4,218,576, Cl. 568-751.000.

Stookey, Donald J.: *See—*
Armstrong, Arthur A.; Baur, Gerd R.; Carpenter, Charles N.; Folk, Edwin W.; Stookey, Donald J.; and Voges, Robert L., 4,218,358, Cl. 260-32.60N.

Storage Technology Corporation: *See—*
Elder, J. Mark; and Ruether, Peter G., 4,218,587, Cl. 370-81.000.

Stork Brabant B.V.: *See—*
Vertegaal, Jacobus-Gerardus; and Anselrode, Lodewijk, 4,217,821, Cl. 101-181.000.

Stork, Karl: *See—*
Daubach, Ewald; Herrmann, Manfred; Oppenlaender, Knut; and Stork, Karl, 4,218,218, Cl. 8-550.000.

Storm, Ole: *See—*
Neuhaeusser, Horst; and Storm, Ole, 4,217,991, Cl. 221-89.000.

Stout, James T., to Mead Corporation, The. Article carrier. 4,217,983, Cl. 206-187.000.

Stowell, Donald E.; Scamehorn, John F.; and Bendig, Larry L., to Conoco, Inc. High pore volume alumina powders. 4,218,413, Cl. 264-13.000.

Strano, Mario F.: *See—*
Sielman, Peter F.; Strano, Mario F.; and Tressa, Frank J., 4,218,772, Cl. 455-20.000.

Stratford/Graham Engineering Corporation: *See—*
Webb, Orlando, Jr., 4,218,575, Cl. 585-715.000.

Stratton, Lawrence J.: *See—*
Johnston, Reed H.; Jeffreys, Dennis C.; and Stratton, Lawrence J., 4,218,655, Cl. 455-39.000.

Stringham, Leroy O.; and Lawrence, Michael J., to Champion International Corporation. Method for die cutting a plastic web. 4,218,497, Cl. 427-289.000.

Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., to Dow Chemical Company, The. Method of producing maleic anhydride. 4,218,383, Cl. 260-346.750.

Strong, John D. Collection and utilization of solar energy. 4,217,884, Cl. 126-438.000.

Stryker Corporation: *See—*
Eaton, Russell K., 4,217,964, Cl. 173-163.000.

Stterdal, Edgar, to Aktiebolaget Svenska Flaktfabriken. Axial fan. 4,218,188, Cl. 416-172.000.

Studt, William L.: *See—*
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,218,450, Cl. 424-248.540.

Stuible, Ewald: *See—*
Grather, Gunter; Rabus, Friedrich; and Stuible, Ewald, 4,217,868, Cl. 123-416.000.

Sturgis, Donald P.: *See—*
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., 4,218,690, Cl. 340-149.00R.

Sturm, Alfred, to Swiss Aluminium Ltd. Covering for a cell for fused salt electrolysis. 4,218,300, Cl. 204-247.000.

Stylar Industries, Inc.: *See—*
Fefferman, Frank J., 4,217,669, Cl. 5-47.000.

Styring, Ralph E., Jr., to Atlantic Richfield Company. Retorting hydrocarbonaceous solids. 4,218,304, Cl. 208-8.00R.

Suckow, David S., to Caterpillar Tractor Co. Shaft vibration damper. 4,217,766, Cl. 64-1.00V.

Suehiro, Tetsuro: *See—*
Sasaki, Kanji; Suehiro, Tetsuro; and Okada, Akira, 4,218,321, Cl. 210-259.000.

Sugai, Hiroshi; and Ogawa, Haruo, to Kabushiki Kaisha Morita Seisakusho. Method of lubricating dental hand-piece and small-sized oiler for use therein. 4,218,216, Cl. 433-104.000.

Sugasawa, Fukashi; Marumo, Nagayuki; Iizuka, Haruhiko; and Matsumoto, Junichiro, to Nissan Motor Company, Limited. Engine load detection system for automatic power transmission. 4,217,795, Cl. 74-858.000.

Sugawara, Isao: *See—*
Sakamoto, Shigeru; Moriyama, Hiroyuki; Fujii, Ryosuke; Ishii, Toshiharu; Sugawara, Isao; and Kikuchi, Minoru, 4,217,762, Cl. 62-132.000.

Sugimoto, Atsumi: *See—*
Inaba, Masao; and Sugimoto, Atsumi, 4,218,705, Cl. 358-149.000.

Sugimoto, Isao, to Nippon Dyeing Machine Mfg. Co., Ltd.; and Yoshida Kogyo K.K. Dyeing apparatus. 4,217,768, Cl. 68-20.000.

Suhr, Robert G.: *See—*
Taylor, Harold M.; and Suhr, Robert G., 4,218,238, Cl. 71-94.000.

Sukolics, Ronald D., to Swiss Aluminium Ltd. Special purpose window. 4,217,833, Cl. 109-19.000.

Sullivan, Ann: *See—*
Comai, Karen; Sullivan, Ann; and Westley, John, 4,218,443, Cl. 424-181.000.

Sumikawa, Satoshi, to Kure Tekko Company Ltd. Apparatus for preventing transmission of vibration of a vibration machine. 4,217,677, Cl. 16-119.000.

Sumitomo Chemical Company, Limited: *See—*
Atsumi, Toshio; Tarumi, Yuzo; and Yoshida, Noboru, 4,218,457, Cl. 424-263.000.

Sun, Shan C., to Westinghouse Electric Corp. Protective relay apparatus. 4,218,718, Cl. 361-79.000.

Sun, Yun C., to Dow Chemical Company, The. Method for controlling the regeneration and desorbtion of an absorbent material. 4,218,224, Cl. 55-20.000.

Suzuki, Hirosuke. High frequency flat cable. 4,218,581, Cl. 174-117.00F.

Suzuki, Mitsuyuki: *See—*
Masuda, Noboru; and Suzuki, Mitsuyuki, 4,217,779, Cl. 73-313.000.

Suzuki, Takashi: *See—*
Nishio, Kanemitsu; Suzuki, Takashi; Uenaga, Toshihiko; and Zega, Fumio, 4,217,873, Cl. 123-653.000.

Suzuki, Yuziro: *See—*
Kawamura, Kunio; Yasukuni, Mitsuo; Iida, Takashi; and Suzuki, Yuziro, 4,218,120, Cl. 354-227.000.

Swaim, Ronald L., to Vydec, Inc. Matrix printer. 4,218,150, Cl. 400-124.000.

Swarts, William A.: *See—*
Mageli, Orville L.; and Swarts, William A., 4,218,548, Cl. 525-387.000.

Sweet, Roger H.: *See—*
Flicker, Alcwyn; Gay, Derek J.; Rhodes, Tony; and Sweet, Roger H., 4,217,726, Cl. 46-120.000.

Swindlehurst, Carl P.; and Navarro, Sam J., to General Motors Corporation. Vehicle vinyl top and top retainer means. 4,218,088, Cl. 296-137.00R.

Swiss Aluminium Ltd.: *See—*
Sturm, Alfred, 4,218,300, Cl. 204-247.000.
Sukolics, Ronald D., 4,217,833, Cl. 109-19.000.

Sybron Corporation: *See*—
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Sylvan R. Shemitz and Associates, Inc.: *See*—
Shemitz, Sylvan R.; and Stahlheber, Benjamin L., 4,218,727, Cl. 362-297.000.
Synthelabo: *See*—
Langer, Salomon Z.; and Roach, Allan G., 4,218,466, Cl. 424-275.000.
Szilagyi nee Farago, Katalin: *See*—
Solyom, Sandor; Toldy, Lajos; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,218,446, Cl. 424-241.000.
Szondy, Eleonora: *See*—
Solyom, Sandor; Toldy, Lajos; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,218,446, Cl. 424-241.000.
Szymczyk, Boleslaw: *See*—
Jaromin, Zygmunt; Szymczyk, Boleslaw; Blazewicz, Andrzej; and Pilarski, Klemens, 4,218,095, Cl. 299-87.000.
Tabak, Samuel A.; and Morrison, Roger A., to Mobil Oil Corporation. Xylene isomerization. 4,218,573, Cl. 585-481.000.
Tabata, Kinji: *See*—
Daido, Toshihiko; Koreeda, Kiyoshi; Kunimatsu, Hiroshi; and Tabata, Kinji, 4,217,841, Cl. 112-277.000.
Tabata, Yasuhiro: *See*—
Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,128, Cl. 355-14.0SH.
Satomi, Toyokazu; Koizumi, Yutaka; Miyakawa, Seiichi; Nakamura, Isao; Tabata, Yasuhiro; and Kaneko, Tamaki, 4,218,130, Cl. 355-14.00R.
Tada, Naofumi; and Aihara, Katsuzo, to Hitachi, Ltd. Superconductive magnet device. 4,218,668, Cl. 335-216.000.
Taisei Corporation: *See*—
Sakamoto, Shigeru; Moriyama, Hiroyuki; Fujii, Ryosuke; Ishii, Toshiharu; Sugawara, Isao; and Kikuchi, Minoru, 4,217,762, Cl. 62-132.000.
Taiyo Steel Co., Ltd.: *See*—
Kameya, Toru; and Aoyama, Yuji, 4,218,501, Cl. 428-90.000.
Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Vaporized-metal cluster ion source and ionized-cluster beam deposition device. 4,217,855, Cl. 118-719.000.
Takagi, Toshinori; Morimoto, Kiyoshi; and Utamura, Yukihiko, to Futaba Denshi Kogyo K.K. Schottky barrier type solid-state element. 4,218,495, Cl. 427-42.000.
Takamatsu, Hideo: *See*—
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Takashi, Terada: *See*—
Kooichi, Yoshida; Eitoshi, Shozi; Hiroshi, Ootaki; and Takashi, Terada, 4,218,433, Cl. 424-15.000.
Takeda Riken Kogyo Kabushikikaisha: *See*—
Haraguchi, Hirofumi, 4,218,736, Cl. 364-483.000.
Takei, Yoshiaki: *See*—
Shinozaki, Sohji; Takei, Yoshiaki; and Iwahashi, Haruo, 4,218,124, Cl. 355-3.0SC.
Takeichi, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha. Developer collection device for a copying machine. 4,218,126, Cl. 355-3.00R.
Takenaka, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron gun. 4,218,634, Cl. 315-16.000.
Takeuchi, Koji; Zama, Takashi; and Iwai, Shizuo, to Ajinomoto Company, Incorporated. Retarder for gypsum plaster and a process for retarding the setting of gypsum plaster by the use thereof. 4,218,261, Cl. 106-111.000.
Takeuchi, Kouji; Nakamura, Masao; Kitamura, Nobuyoshi; and Matsuura, Shohachi, to Ajinomoto Company, Incorporated. Stabilized halogen-containing resin compositions. 4,218,352, Cl. 260-23.0XA.
Takigawa, Hiroyoshi; and Tezuka, Toshiro, to Bridgestone Tire Company Limited. Heavy duty pneumatic tire. 4,217,942, Cl. 152-209.00R.
Talarico, Lawrence L.: *See*—
Chapman, Bruce H.; Oliver, James E.; and Talarico, Lawrence L., 4,217,695, Cl. 33-134.00R.
Tam, George M.: *See*—
Bach, Lloyd G.; Brown, Arthur K., Jr.; and Tam, George M., 4,217,758, Cl. 60-404.000.
Tam, Johann, to Silicon Valley Group, Inc., The. Conveyor system. 4,217,977, Cl. 198-341.000.
Tamada, Yukio, to Roland Corporation. Apparatus and method for writing rhythm information in storage. 4,217,805, Cl. 84-1.030.
Tamada, Yukio: *See*—
Sakai, Tadao; and Tamada, Yukio, 4,217,806, Cl. 84-1.030.
Tamou, Takuya: *See*—
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Tanabe Seiyaku Co., Ltd.: *See*—
Ikezaki, Muneyoshi; Otsuka, Hisao; Iwai, Hajime; Inamasu, Masanori; and Morita, Takashi, 4,218,479, Cl. 424-330.000.
Samejima, Masayoshi; and Hirata, Goichi, 4,218,333, Cl. 252-316.000.
Tanabe, Susumu: *See*—
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Tanaka, Hiroshi; and Saito, Takashi, to Canon Kabushiki Kaisha. Method of electrophotographic recording involving removal of excess developer liquid by corona treatment. 4,218,246, Cl. 430-126.000.
Tarumi, Yuzo: *See*—
Atsumi, Toshio; Tarumi, Yuzo; and Yoshida, Noboru, 4,218,457, Cl. 424-263.000.
Taylor, Harold M.; and Suhr, Robert G., to Eli Lilly and Company. Herbicidal 1-alkyl-3-phenylpyridinium salts. 4,218,238, Cl. 71-94.000.
Taylor, Ray H.: *See*—
Steinbergs, Arvey Z.; Taylor, Ray H.; and Whalen, James T., 4,218,592, Cl. 179-175.20D.
TDK Electronics Company Limited: *See*—
Yoshizawa, Keiichi, 4,218,722, Cl. 361-149.000.
Teager, Robert S.; and Galvin, Richard S., to Westinghouse Electric Corp. Insulated hub arrangement for high temperature centrifugal fan. 4,218,186, Cl. 416-95.000.
Teijin Limited: *See*—
Hara, Shigeyoshi; and Omae, Iwao, 4,218,247, Cl. 430-78.000.
Teledyne Hanau Division of Teledyne, Inc.: *See*—
Beu, Richard A., 4,218,205, Cl. 425-180.000.
Teledyne Industries, Inc.: *See*—
Mehne, John T., 4,218,193, Cl. 417-364.000.
Teraji, Tsutomu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,218,374, Cl. 260-245.20R.
Terrain King Corporation: *See*—
Larson, Walter F., 4,217,789, Cl. 74-470.000.
Terrones, Thelma L. Pleat filler and drapery hanger combination. 4,217,676, Cl. 16-87.200.
Terumo Corporation: *See*—
Sagae, Kyuta; Tanabe, Susumu; and Kamogawa, Hiroshi, 4,217,895, Cl. 128-214.400.
Tesei, Renato: *See*—
Romano, Ugo; Tesei, Renato; Cipriani, Gioacchino; and Micucci, Lidio, 4,218,391, Cl. 260-463.000.
Tesson, Prosper A. Pipe handling method and apparatus. 4,218,158, Cl. 405-170.000.
Tetra Pak International AB: *See*—
Fuchs, Alfred; and Andersson, Erik T., 4,218,265, Cl. 134-18.000.
Texaco Canada Inc.: *See*—
Goss, Michael J.; and Exall, Douglas I., 4,217,956, Cl. 166-272.000.
Texaco Development Corporation: *See*—
Vanderpool, Steven H., 4,218,403, Cl. 568-428.000.
Texaco Inc.: *See*—
Crone, John M., Jr., 4,217,757, Cl. 60-288.000.
Crouch, William B.; Fabiero nee Posadas, Carolina Z.; and Robin, Allen M., 4,218,326, Cl. 252-8.55D.
Doster, Martha S.; and Kudchadker, Mohan V., 4,217,958, Cl. 166-274.000.
McCall, Richard H., 4,217,776, Cl. 73-141.00R.
Nolan, John T., Jr.; McMahon, Matthew A.; Kessler, Richard V.; and Corbeels, Roger J., 4,218,222, Cl. 48-202.000.
Parrack, Alvin L.; Lunsford, Delbert R.; and Mikita, Ronald A., 4,218,766, Cl. 367-47.000.
Robin, Allen M.; and Catena, Americo R., 4,218,423, Cl. 422-207.000.
Schievelbein, Vernon H., 4,217,957, Cl. 166-273.000.
Texas Instruments Incorporated: *See*—
Frank, Steven N., 4,218,519, Cl. 429-15.000.
Hewes, Charles R.; and Mayer, Dale J., 4,218,752, Cl. 364-825.000.
Textron, Inc.: *See*—
Hartmann, Wilhelm U.; Augustine, Larry C.; and Ryan, Daniel J., 4,218,324, Cl. 210-493.00R.
Tezuka, Toshiro: *See*—
Takigawa, Hiroyoshi; and Tezuka, Toshiro, 4,217,942, Cl. 152-209.00R.
Thayer, John R., to Babcock & Wilcox Company, The. Liquid level gauge illuminating system. 4,217,778, Cl. 73-293.000.
Theeuwes, Felix, to Alza Corporation. System with microporous reservoir having surface for diffusional delivery of agent. 4,217,898, Cl. 128-260.000.
Theodore, Frank W., to Continental Oil Company. Apparatus and method for compacting, degassing and carbonizing carbonaceous agglomerates. 4,218,288, Cl. 201-12.000.
Theodore, Vernon M. Heating apparatus for internal combustion engines. 4,217,864, Cl. 123-41.140.
Thetford Corporation: *See*—
Sargent, Charles L.; Hoffman, John A.; Antos, John M.; and Henke, Arthur W., 4,217,668, Cl. 4-321.000.
Thiemer, Klaus: *See*—
Isaac, Otto; Posselt, Klaus; Uthemann, Horst; and Thiemer, Klaus, 4,218,447, Cl. 424-241.000.
Thijs, Petrus J. A.: *See*—
van Oirschot, Theodorus G. J.; Leswin, Willem J.; Thijs, Petrus J. A.; and Nijman, Willem, 4,218,269, Cl. 148-171.000.
Thirumalachar, Mandayam J.; Narasimhan, Mandayam J., Jr.; and Kasthuri-Thirumalachar, Mandayam J. N,N'Dibenzylethylenediamine-diacetylsalicylate, a novel chemotherapeutic agent for pain relief by external application. 4,218,445, Cl. 424-230.000.
Thompson Bagel Machine Manufacturing Corp.: *See*—
Thompson, Daniel T., 4,218,207, Cl. 425-241.000.
Thompson, Daniel T., to Thompson Bagel Machine Manufacturing Corp. Dough-dividing and toroid-forming apparatus. 4,218,207, Cl. 425-241.000.
Thompson, James A., to De Lorean Manufacturing Company. Low disturbance track cleat and ice calk structure for firm or icy snow. 4,218,101, Cl. 305-35.0EB.

Thompson, Paul F.: *See*—
Bahder, George; and Thompson, Paul F., 4,218,577, Cl. 174-23.00C.
Thompson, Ralph B., to Air Resources, Inc. Composition for catalytic removal of hydrogen sulfide from gases. 4,218,342, Cl. 252-431.00C.
Thomson-CSF: *See*—
de Cremoux, Baudouin, 4,218,692, Cl. 357-19.000.
Lazarus, Michel, 4,218,656, Cl. 455-59.000.
Vialatte, Claude, 4,218,640, Cl. 318-331.000.
Thyssen Aktiengesellschaft Vorm. August Thyssen-Mutte: *See*—
Eschenberg, Rudolf; and Schafer, Herbert, 4,218,212, Cl. 432-247.000.
Tilgner, Peter J., to Upjohn Company, The. Multi-station reaction injection molding apparatus. 4,218,203, Cl. 425-110.000.
Tillman, Richard M.: *See*—
Jackson, Robert G.; and Tillman, Richard M., 4,218,389, Cl. 260-449.500.
Timex Corporation: *See*—
Grohoski, Raymond; and Mileos, George, 4,217,681, Cl. 24-265.0WS.
Timmons, William K.; and Koss, George A., to Ford Motor Company. Device for dispensing a mirror button. 4,217,992, Cl. 221-113.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Itoh, Takuji; and Akitsuki, Ikuo, 4,218,308, Cl. 208-143.000.
Todaro, Anthony. Automatic wire stripper. 4,217,691, Cl. 30-90.100.
Todd, Donald K.: *See*—
Schubert, James P.; and Todd, Donald K., 4,218,314, Cl. 210-23.00H.
Tohyama, Yoshikuni: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,218,131, Cl. 355-15.000.
Tokai TRW & Co., Ltd.: *See*—
Abe, Michio, 4,217,793, Cl. 74-499.000.
Tokuda, Kenji: *See*—
Kiyonaga, Kingo; Okuno, Toshio; and Tokuda, Kenji, 4,218,243, Cl. 75-124.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ito, Masayuki, 4,218,734, Cl. 364-118.000.
Takeichi, Fujio, 4,218,126, Cl. 355-3.00R.
Takenaka, Shigeo, 4,218,634, Cl. 315-16.000.
Tsunoda, Sachio; and Harada, Kiyoshi, 4,218,182, Cl. 415-205.000.
Toldy, Lajos: *See*—
Solyom, Sandor; Toldy, Lajos; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,218,446, Cl. 424-241.000.
Tominaga, Yutaka: *See*—
Shimamatsu, Hidenori; and Tominaga, Yutaka, 4,217,728, Cl. 47-1.400.
Tomioka, Shinji: *See*—
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,218,562, Cl. 536-17.00R.
Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Satoh, Katsuhiko; Mandai, Masaaki; and Shida, Masaharu, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,217,751, Cl. 368-76.000.
Totten, George E.: *See*—
Williams, Thomas C.; and Totten, George E., 4,218,513, Cl. 428-419.000.
Totten, Patsy L.: *See*—
Watson, Jimmie L.; and Totten, Patsy L., 4,218,316, Cl. 210-51.000.
Townsend, John M.: *See*—
Manchand, Percy S.; and Townsend, John M., 4,218,567, Cl. 562-475.000.
Toyo Cloth Co., Ltd.: *See*—
Shiga, Yasuhiro; and Hida, Yoshikazu, 4,218,505, Cl. 428-306.000.
Toyo Engineering Corporation: *See*—
Konoki, Keizo; and Nobue, Michio, 4,218,397, Cl. 260-555.00A.
Toyo Kogyo Co., Ltd.: *See*—
Morita, Yasuyuki; and Iwamoto, Yasuhiko, 4,218,200, Cl. 418-84.000.
Toyoda Jidosha Kogyo Kabushiki Kaisha: *See*—
Yasui, Yasuyoshi; Uno, Makoto; and Sanui, Yoshio, 4,217,794, Cl. 74-700.000.
Tozaki, Eishun: *See*—
Oda, Shinichi; Aoyagi, Shoji; Kuroda, Takio; and Tozaki, Eishun, 4,218,506, Cl. 428-327.000.
Tracy, Gene A., to Cornelius Company, The. Multiple flavor post-mix beverage dispensing head. 4,218,014, Cl. 239-106.000.
Trekoval, Jiri: *See*—
Sevcik, Stanislav; Trekoval, Jiri; Holata, Jan; and Stamberg, Jiri, 4,218,552, Cl. 526-173.000.
Trendmark Corporation: *See*—
Cannon, Thomas G., 4,218,611, Cl. 235-92.00T.
Tressa, Frank J.: *See*—
Sielman, Peter F.; Strano, Mario F.; and Tressa, Frank J., 4,218,772, Cl. 455-20.000.
Triprint Pty. Ltd.: *See*—
Milligan, Donald D., 4,217,822, Cl. 101-211.000.
Trott, Beverly D.: *See*—
Canty, Michael P.; Caudy, Don W.; Hackman, Donald J.; Harris, Jeremy M.; Mowery, Robert W.; Riley, George R.; and Trott, Beverly D., 4,217,717, Cl. 42-1.00R.
Trytek, Joseph J. Flexible fluid conduit for propeller shaft. 4,218,185, Cl. 416-20.00R.
Tsai, Reysen, to General Electric Company. Reverse power flow detector and control circuit. 4,218,719, Cl. 361-82.000.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, to Olympus Optical Co., Ltd. Roll sheet cassette loading apparatus. 4,218,135, Cl. 355-72.000.
Tsunoda, Sachio; and Harada, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Casings of hydraulic machines. 4,218,182, Cl. 415-205.000.
Tsutsumi, Shinya: *See*—
Hayashi, Seizo; Tsutsumi, Shinya; and Kuroki, Yoshihiro, 4,217,674, Cl. 15-361.000.
Tsuzura, Junichi, to Bridgestone Tire Company Limited. Lug tire for agricultural machines. 4,217,943, Cl. 152-209.00B.
Tuckerman, Edward M., to Gillette Company, The. Method for producing a spark wheel. 4,217,797, Cl. 76-101.00A.
Tuftco Corporation: *See*—
Beasley, Max M.; Defore, Leroy A.; and King, Hugh C., 4,217,837, Cl. 112-79.00R.
Tumansky, Alexandr S.: *See*—
Brusilovsky, Mikhail G.; Krasnokutsky, Valentin P.; Nemtinova, Galina I.; Novozhilov, Evgeny N.; Pekarsky, Viktor A.; Platonova, Svetlana A.; and Tumansky, Alexandr S., 4,218,390, Cl. 260-453.0AB.
Turley, Richard J., to Olin Corporation. Halogenated tertiary phosphite esters. 4,218,405, Cl. 260-967.000.
Turner, James G., Jr. Fireplace insert. 4,217,880, Cl. 126-131.000.
Turner, James P.: *See*—
Nutting, Donald; and Turner, James P., 4,217,807, Cl. 84-402.000.
Tuttle, Lawrence L.: *See*—
Emmett, Robert C., Jr.; and Tuttle, Lawrence L., 4,217,916, Cl. 134-104.000.
Tuuk Sports Ltd.: *See*—
Baikie, Hugh E., 4,218,069, Cl. 280-11.120.
Tynes, William J., III: *See*—
Baxter, Robert, Jr.; Antoci, Frank J.; Tynes, William J., III; Petrucci, Pasquale M.; and Martin, George F., 4,218,610, Cl. 235-92.0PC.
Tyznik, William J.: *See*—
Cook, C. Dale; Tyznik, William J.; and DeMarco, Peter F., 4,218,482, Cl. 426-72.000.
U.G. Closures & Plastics Limited: *See*—
Mills, Frederick; Hopley, Eric T.; Curtis, Raymond; and Wraighte, Patrick M., 4,217,988, Cl. 215-21.000.
Uberbacher, Edward C., to International Business Machines Corporation. Optical fiber connector apparatus. 4,218,113, Cl. 350-96.210.
Uchiyama, Yasuji: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,217,804, Cl. 84-1.030.
Uchiyama, Yoshitada: *See*—
Ohashi, Kanji; Kontani, Kazuo; Uchiyama, Yoshitada; and Motohashi, Kinichi, 4,217,871, Cl. 123-501.000.
Ueda, Makoto: *See*—
Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Satoh, Katsuhiko; Mandai, Masaaki; and Shida, Masaharu, 4,217,751, Cl. 368-76.000.
Uehara, Masafumi: *See*—
Shimada, Fumio; Matsuzaki, Masatoshi; and Uehara, Masafumi, 4,218,528, Cl. 430-76.000.
Uenaga, Toshihiko: *See*—
Nishio, Kanemitsu; Suzuki, Takashi; Uenaga, Toshihiko; and Zega, Fumio, 4,217,873, Cl. 123-653.000.
Uhlyarik, Emanuel J. Energy-saving forced-air furnace. 4,217,877, Cl. 126-99.00R.
Ukihashi, Hiroshi; Asawa, Tatsuro; and Gunjima, Tomoki, to Asahi Glass Company Limited. Cation exchange membrane of fluorinated polymer containing polytetrafluoroethylene fibrils for electrolysis and preparation thereof. 4,218,542, Cl. 521-27.000.
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., to A-T-O, Inc. Self-contained programmable terminal for security systems. 4,218,690, Cl. 340-149.00R.
Ulrichsen, John E.: *See*—
Reed, Lloyd D.; Howat, M. Ross; and Ulrichsen, John E., 4,218,707, Cl. 358-113.000.
Underwood, David C.: *See*—
Logan, Ted J.; Underwood, David C.; and Rheinecker, Tom C., 4,218,386, Cl. 260-415.000.
Unger, Henry M. Device for screwing in and out electrical lamps. 4,218,085, Cl. 294-20.000.
Union Carbide Corporation: *See*—
Albright, Charles W.; and Davis, H. G., 4,218,287, Cl. 201-9.000.
Burhans, Allison S.; and Berger, Sidney E., 4,218,360, Cl. 260-37.0EP.
Kalnoki-Kis, Tibor, 4,218,523, Cl. 429-101.000.
Mellors, Geoffrey W., 4,218,527, Cl. 429-191.000.
Shenoy, Thirtahalli A., 4,217,759, Cl. 62-27.000.
Williams, Thomas C.; and Totten, George E., 4,218,513, Cl. 428-419.000.
United Products Inc.: *See*—
Johnson, Norman S., 4,218,081, Cl. 292-66.000.
United States Bedding Company, The: *See*—
Golembeck, Gerald A.; and Wilwert, Eugene D., 4,217,840, Cl. 112-265.200.
United States of America
Agriculture: *See*—
Schwab, Arthur W.; Gast, Lyle E.; and Kenney, Harold E., 4,218,332, Cl. 252-48.600.
Army: *See*—

Buscher, David J.; Ellingwood, Robert G.; and Ressler, Marc A., 4,218,737, Cl. 364-493.000.
Dent, John R., 4,217,827, Cl. 102-214.000.
Guazzoni, Guido; and Herchakowski, Andrew, 4,218,266, Cl. 136-209.000.
Logan, Scott R., 4,218,156, Cl. 403-320.000.
Selgin, Paul J., 4,218,525, Cl. 429-114.000.
Sielman, Peter F.; Strano, Mario F.; and Tressa, Frank J., 4,218,772, Cl. 455-20.000.

Health, Education and Welfare: *See—*
McCarthy, Charles J.; and Green, Maurice, 4,217,798, Cl. 81-3.200.

National Aeronautics and Space Administration; administrator; with respect to an invention of:
Ellis, Haynes, Jr. Coaxial phased array antenna. 4,218,685, Cl. 343-727.000.
Matzen, Walter J. Apparatus for measuring semiconductor device resistance. 4,218,650, Cl. 324-62.000.
Yu, I-Ping. Multiple band circularly polarized microstrip antenna. 4,218,682, Cl. 343-700.0MS.

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Mirtich, Michael J., Jr.; Sovey, James S.; and Roman, Robert F., 4,218,633, Cl. 313-362.000.
Philipp, Warren H.; May, Charles E.; Hsu, Li-Chen; and Sheibley, Dean W., 4,218,280, Cl. 156-272.000.

Navy: *See—*
Bottka, Nicholas, 4,218,143, Cl. 356-445.000.
Canty, Michael P.; Caudy, Don W.; Hackman, Donald J.; Harris, Jeremy M.; Mowery, Robert W.; Riley, George R.; and Trott, Beverly D., 4,217,717, Cl. 42-1.00R.
Giannaula, Joseph J.; and Reever, Kenneth P., 4,218,110, Cl. 339-154.00A.
Khalil, Hassan H., 4,217,910, Cl. 128-670.000.
Young, Charles, Jr.; and Goo, Gee-In, 4,217,826, Cl. 102-200.000.

U.S. Philips Corporation: *See—*
Brundle, Leonard K.; Longley, Stuart R.; and Coleman, Michael D., 4,218,663, Cl. 333-17.00L.
Dalisa, Andrew L.; and Seymour, Robert J., 4,218,302, Cl. 204-299.00R.
Gee, Lawrence F.; Jarvis, Denis B.; and Aldhous, Christopher J., 4,218,693, Cl. 357-41.000.
Haisma, Jan; and Van Mierloo, Klaas L. L., 4,218,762, Cl. 365-32.000.
van der Hoek, Willem; and Camerik, Eduard, 4,218,065, Cl. 274-9.00R.
van Oirschot, Theodorus G. J.; Leswin, Willem J.; Thijs, Petrus J. A.; and Nijman, Willem, 4,218,269, Cl. 148-171.000.
Wood, Colin E. C., 4,218,271, Cl. 148-175.000.

United Technologies Corporation: *See—*
Ackermann, William, 4,218,066, Cl. 277-53.000.
Grantham, Daniel H., 4,218,301, Cl. 204-251.000.
Madden, John F., 4,218,187, Cl. 416-145.000.
Pike, Roscoe A., 4,218,385, Cl. 260-408.000.

University of Dayton: *See—*
Bajpai, Praphulla K.; and Graves, George A., 4,218,255, Cl. 106-45.000.

University of Illinois Foundation: *See—*
Payne, David A.; and Park, Sang M., 4,218,723, Cl. 361-321.000.

University of Rochester, The: *See—*
Mourou, Gerard, 4,218,618, Cl. 250-211.00J.

Uno, Makoto: *See—*
Yasui, Yasuyoshi; Uno, Makoto; and Sanui, Yoshio, 4,217,794, Cl. 74-700.000.

UOP Inc.: *See—*
Anderson, Robert F., 4,218,574, Cl. 585-719.000.
Rohrbach, Ronald P.; and Lester, George W., 4,218,363, Cl. 260-42.140.

Upjohn Company, The: *See—*
Bundy, Gordon L., 4,218,378, Cl. 260-333.000.
Fitzpatrick, Francis A., 4,218,436, Cl. 424-85.000.
Hajek, James D.; and McReynolds, Earl E., 4,218,289, Cl. 202-161.000.
Tilgner, Peter J., 4,218,203, Cl. 425-110.000.

Ursel, Eckhard: *See—*
Seibicke, Horst; and Ursel, Eckhard, 4,218,018, Cl. 239-284.00A.

Ushio, Fusao; and Okuno, Noboru, to Matsushita Electric Industrial Co., Ltd. Video signal compensation system. 4,218,696, Cl. 358-8.000.

Utagawa, Ken, to Nippon Kogaku K.K. Device for detecting displacement of an optical image. 4,218,623, Cl. 250-578.000.

Utamura, Yukihiko: *See—*
Takagi, Toshinori; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,218,495, Cl. 427-42.000.

Uthemann, Horst: *See—*
Isaac, Otto; Posselt, Klaus; Uthemann, Horst; and Thiemer, Klaus, 4,218,447, Cl. 424-241.000.

Uto, Lee D.: *See—*
Mineck, Fred, 4,217,791, Cl. 74-482.000.

Vad, Janos: *See—*
Nadasy, Miklos; Kovacs, Miklos; Kolcsei, Marton; Vad, Janos; Bartha, Bela; Dobozy, Otto; Mate, Ferenc; and Karacsonyi nee Spindler, Eva, 4,218,234, Cl. 71-86.000.

Vakil, Himanshu B.; and Flock, John W., to General Electric Company. Vapor compression cycle device with multi-component working fluid mixture and method of modulating its capacity. 4,217,760, Cl. 62-114.000.

Vale, Wylie W., Jr.: *See—*
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,218,439, Cl. 424-177.000.

Valmet Oy: *See—*
Kroger, Keijo K.; and Ojanen, Pekka E., 4,218,174, Cl. 414-786.000.

Van Der Burg, Sjirk. Tire retreading method including adding reinforcing belt. 4,218,277, Cl. 156-96.000.

van der Hoek, Willem; and Camerik, Eduard, to U.S. Philips Corporation. Arrangement for centering, aligning and retaining a rotating record. 4,218,065, Cl. 274-9.00R.

van der Kemp, Leo A. A.: *See—*
Grendelman, Mannes; Poiesz, Mattheus J.; and van der Kemp, Leo A. A., 4,217,935, Cl. 138-109.000.

Vanderpool, Steven H., to Texaco Development Corporation. Synthesis of aromatic aldehydes. 4,218,403, Cl. 568-428.000.

Vanecek, Michael J.; Piepenhagen, John H. K.; Neale, Michael J.; Lasiter, Steven M.; and Bailey, Raymond A., to Georgetown Texas Steel Corp. Suspended gas shroud apparatus. 4,218,048, Cl. 266-236.000.

Van Eerden, Richard L.: *See—*
Schach, Robert E.; and Van Eerden, Richard L., 4,218,092, Cl. 297-367.000.

Van Gorder, Jack H., to General Motors Corporation. Thermally controlled oil storage reservoir for a transmission. 4,217,926, Cl. 137-389.000.

vanManen, Dick T.: *See—*
Miller, Phillip L.; and vanManen, Dick T., 4,217,687, Cl. 29-527.200.

Van Mierloo, Klaas L. L.: *See—*
Haisma, Jan; and Van Mierloo, Klaas L. L., 4,218,762, Cl. 365-32.000.

van Oirschot, Theodorus G. J.; Leswin, Willem J.; Thijs, Petrus J. A.; and Nijman, Willem, to U.S. Philips Corporation. Method for the epitaxial deposition of several layers. 4,218,269, Cl. 148-171.000.

Van Ooij, Willy J., to Akzo NV. Article of manufacture having a metallic surface coated with an elastomer and an intermediate cobalt-copper alloy coating to improve the adhesion of the elastomer. 4,218,517, Cl. 428-614.000.

Van Sickle, Robert J., to Rail Bearing Service. Method of and apparatus for measuring the axial displacement (lateral) of a tapered roller bearing assembly for use in railroad rolling stock. 4,217,698, Cl. 33-174.00R.

Van Sickle, Robert J., to Rail Bearing Service. Method of and apparatus for effecting combined surface finishing operations for a tapered roller bearing cup. 4,217,733, Cl. 51-103.00R.

Vartanian, Vincent A. Boot for walking cast. 4,217,706, Cl. 36-110.000.

Vasalos, Iacovos A., to Standard Oil Company (Indiana). Catalytic cracking with reduced emission of noxious gases. 4,218,344, Cl. 252-455.00Z.

Vaseen, Vesper A. Fuel cell use of gaseous fuels and oxygen provided at electrode absorbed in liquid dielectric. 4,218,518, Cl. 429-14.000.

Vaudrey, Pierre, to Alsthom-Atlantique. Regulation system for steam turbines. 4,217,810, Cl. 91-363.00A.

Vaughan, Ronald J., to Chevron Research Company. Lubricating oil additive. 4,218,328, Cl. 252-33.300.

Veilleux, Gerald R., to Keyes Fibre Company. Container holding socket for molded tray. 4,218,008, Cl. 229-2.50R.

Velenyi, Louis J.: *See—*
Dolhyj, Serge R.; and Velenyi, Louis J., 4,218,572, Cl. 585-400.000.

Vemag Verdener Maschinen-und Apparatebau GmbH: *See—*
Plewa, Manfred; Jaschinski, Claus-Dieter; and Meier, Dieter, 4,218,003, Cl. 226-104.000.

Vertegaal, Jacobus-Gerardus; and Anselrode, Lodewijk, to Stork Brabant B.V. Printing apparatus utilizing flexible metal sleeves as ink transfer means. 4,217,821, Cl. 101-181.000.

Vialatte, Claude, to Thomson-CSF. Tachometric measuring device for direct-current motors, and motor equipped with such a device. 4,218,640, Cl. 318-331.000.

Videtto, Ralph B., to Kaiser Aluminum & Chemical Corporation. Method of forming slide gate valve parts. 4,218,256, Cl. 106-58.000.

Viehrig, Wolfgang; and Sperber, Werner, to AGFA-Gevaert, A.G. Machine for developing photographic paper or the like. 4,218,123, Cl. 354-310.000.

Vincent, August, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Cooling plate for a furnace in a metallurgical plant. 4,217,954, Cl. 165-133.000.

Vinokur, Mark L.: *See—*
Atrepiev, Vladimir S.; Vinokur, Mark L.; and Murov, Genrikh F., 4,218,006, Cl. 228-48.000.

Vinyl Clad Proprietary Limited: *See—*
Edwards, Frederick H., 4,218,204, Cl. 425-129.00R.

Virginia Chemicals Inc.: *See—*
Bostian, Logan C.; and Winslow, Charles E., Jr., 4,218,429, Cl. 423-515.000.

Viscose Group Limited: *See—*
Phillips, David J.; Jones, David T.; and Palmer, Douglas E., 4,218,490, Cl. 426-549.000.

Vishnyakova, Galina A.: *See—*
Merzhanov, Alexandr G.; Kachin, Alexandr R.; Jukhvid, Vladimir I.; Borovinskaya, Inna P.; and Vishnyakova, Galina A., 4,217,948, Cl. 164-115.000.

Visman, Jan: *See—*
Hamza, Hassan A.; and Visman, Jan, 4,218,012, Cl. 239-10.000.

Visual Sales Corporation: *See—*
Orr, James E., 4,218,118, Cl. 353-110.000.

Vits, Hilmar, to Vits-Maschinenbau GmbH. Blow box for suspended guidance and/or conveyance of strip material or sheets. 4,218,001, Cl. 226-97.000.
Vits-Maschinenbau GmbH: *See—*
Vits, Hilmar, 4,218,001, Cl. 226-97.000.
Vitter, Gerard: *See—*
Henault, Marc; and Vitter, Gerard, 4,218,297, Cl. 204-195.00S.
Vlsi Technology Research Association: *See—*
Fukuyama, Toshihiko; and Yanagisawa, Shintaro, 4,218,291, Cl. 204-1.00T.
Nakasuji, Mamoru; and Shinozaki, Toshiaki, 4,218,621, Cl. 250-492.00A.
Voest-Alpine Aktiengesellschaft: *See—*
Engel, Kurt; and Spannlang, Ronald, 4,217,951, Cl. 164-448.000.
Scheinecker, Alois; Scheurecker, Werner; and Muhlbauer, Gerhard, 4,217,997, Cl. 222-604.000.
Schwenzfeier, Werner; Neff, Thomas; and Wiesbauer, Karl, 4,218,029, Cl. 242-56.900.
Voges, Robert L.: *See—*
Armstrong, Arthur A.; Baur, Gerd R.; Carpenter, Charles N.; Folk, Edwin W.; Stookey, Donald J.; and Voges, Robert L., 4,218,358, Cl. 260-32.60N.
Von Roll AG: *See—*
Egli, Ernst; Bombelli, Nino; and Misteli, Max, 4,218,050, Cl. 266-281.000.
von Tluck, Wolfgang; and Schlageter, Bernhard, to Siemens Aktiengesellschaft. Device for the transfer process of characters, consisting of toner, that are applied to a continuously rotating band-shaped intermediate carrier. 4,217,819, Cl. 101-1.000.
Voplex Corporation: *See—*
Miller, Phillip L.; and vanManen, Dick T., 4,217,687, Cl. 29-527.200.
Vydec, Inc.: *See—*
Swaim, Ronald L., 4,218,150, Cl. 400-124.000.
W. H. Brady Co.: *See—*
Kissner, William R., 4,218,600, Cl. 200-159.00B.
W-K-M Wellhead Systems, Inc.: *See—*
Peters, Clifford M., 4,217,934, Cl. 137-625.660.
W. R. Grace & Co.: *See—*
Bieler, Anne C.; and Howe, Milton A., 4,218,486, Cl. 426-412.000.
McDaniel, Carl V., 4,218,307, Cl. 208-120.000.
W. Schlafhorst & Co.: *See—*
Rohner, Joachim; Mauries, Reinhard; and Zumfeld, Heinz, 4,217,749, Cl. 57-261.000.
Wacker-Chemie GmbH: *See—*
Marwitz, Heinrich; and Louis, Eckhart, 4,218,359, Cl. 260-33.8SB.
Wagner, Eugene R.; Matthews, Donald P.; and Renzi, Alfred A., to Dow Chemical Company, The. Hypolipidemic benzylaminobenzene alkanoic or alkenoic acids. 4,218,475, Cl. 424-319.000.
Walker, Darrell W.; Hogan, Robert J.; and Farha, Floyd, Jr., to Phillips Petroleum Company. Dehydrogenation of organic compounds. 4,218,343, Cl. 252-435.000.
Walker, Darrell W.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Zinc titanate catalyst for dehydrogenation of hydrocarbons. 4,218,346, Cl. 252-475.000.
Wallis, Alfred R. Vehicle stabilizer. 4,218,072, Cl. 280-689.000.
Walter, Manfred: *See—*
Hahn, Klaus; Walter, Manfred; Stange, Karl; and Weber, Heinz, 4,218,511, Cl. 428-407.000.
Wankel GmbH: *See—*
Eiermann, Dankwart, 4,218,199, Cl. 418-54.000.
Warne, Douglas M.: *See—*
Hoffman, Louie E.; and Warne, Douglas M., 4,217,887, Cl. 126-448.000.
Warner-Lambert Company: *See—*
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., 4,218,455, Cl. 424-263.000.
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., 4,218,456, Cl. 424-263.000.
Warren, Charlotte L., to Balchem Corporation. Nonclumping, delayed action viscosity increasing agent. 4,218,262, Cl. 106-206.000.
Wassen, Johannes, to Mannesmann Aktiengesellschaft. Drawing hollow blanks in multiple steps. 4,217,770, Cl. 72-349.000.
Watanabe, Koichi; Harada, Hiroaki; and Kotone, Akira, to Yamamoto Kagaku Gosei Co., Ltd. Coloring agent and a composition including the same for coloring toilet bowl flushing water. 4,218,432, Cl. 424-14.000.
Watanabe, Takashi, to Hitachi, Ltd. Insulation stator for end turn windings of electric rotary machine. 4,218,630, Cl. 310-260.000.
Watanabe, Tatsuo: *See—*
Ogawa, Akira; Watanabe, Tatsuo; and Saito, Hideki, 4,218,654, Cl. 370-97.000.
Watanabe, Tsukasa, to Aisin Seiki Kabushiki Kaisha. Thermostatic circuit breaker. 4,218,670, Cl. 337-349.000.
Watson, Jimmie L.; and Totten, Patsy L., to Halliburton Company. Method of clarifying and removing water from water-solids suspensions. 4,218,316, Cl. 210-51.000.
Watzka, Roland, to SIG Schweizerische Industrie-Gesellschaft. Twin packaging machine. 4,217,745, Cl. 53-531.000.
Wavin B.V.: *See—*
Grendelman, Mannes; Poiesz, Mattheus J.; and van der Kemp, Leo A. A., 4,217,935, Cl. 138-109.000.
Waycrosse, Inc.: *See—*
Arends, Kenneth W., 4,218,169, Cl. 414-523.000.
Webb, Orlando, Jr., to Stratford/Graham Engineering Corporation. Alkylation effluent flash vaporization with heat recovery. 4,218,575, Cl. 585-715.000.
Weber, Christian; and Schafer, Hermann, to Bayer Aktiengesellschaft. Rim process for the production of elastic moldings. 4,218,543, Cl. 521-51.000.
Weber, Heinz: *See—*
Hahn, Klaus; Walter, Manfred; Stange, Karl; and Weber, Heinz, 4,218,511, Cl. 428-407.000.
Weber, Klaus: *See—*
Escales, Eberhard; Hell, August; Schubert, Andreas; and Weber, Klaus, 4,217,743, Cl. 53-54.000.
Webster, David L., to Kustom Fit Manufacturing Company. Reclinable vehicle chair and conversion method. 4,218,091, Cl. 297-354.000.
Wedemeyer, Karlfried: *See—*
Fiege, Helmut; Wedemeyer, Karlfried; Bauer, Kurt; and olleken, Reiner, 4,218,380, Cl. 260-340.50R.
Weidner, Richard K., to Etablissements Armor, S.A. Stick for applying a liquid. 4,218,155, Cl. 401-132.000.
Weinstock, Leonard M.: *See—*
Love, George M.; Sohar, Paul; and Weinstock, Leonard M., 4,218,563, Cl. 544-21.000.
Weismann, Victor P. Mobile heavy lift mechanism. 4,218,045, Cl. 254-323.000.
Weiss, Martin J.; and Siuta, Gerald J., to American Cyanamid Company. 11-(2-Hydroxyethylthio) prostenoic acid E and F series derivatives. 4,218,566, Cl. 560-121.000.
Weiss, Martin J.: *See—*
Grudzinskas, Charles V.; and Weiss, Martin J., 4,218,565, Cl. 560-121.000.
Weissert, Helmut: *See—*
Hegemann, Karl-Rudolf; and Weissert, Helmut, 4,218,241, Cl. 75-60.000.
Weisshappel, Helmut; and Schmid, Walter, to Daimler-Benz Aktiengesellschaft. Installation in a vehicle for indicating the load distribution and for warning against overloads. 4,218,672, Cl. 340-52.00R.
Weldon, Edward J., Jr.: *See—*
Slepian, David; and Weldon, Edward J., Jr., 4,217,808, Cl. 84-454.000.
Weller, David R., to Bell Telephone Laboratories, Incorporated. Delay modulation data transmission system. 4,218,770, Cl. 375-118.000.
Wellern, Wilfried: *See—*
Schmidt-Roedenbeck, Heiner; Wust, Peter; and Wellern, Wilfried, 4,217,754, Cl. 60-39.28R.
Wellington, Scott L., to Shell Oil Company. Stabilizing the viscosity of an aqueous solution of polysaccharide polymer. 4,218,327, Cl. 252-8.55D.
Weltman, Joel K. Enzyme conjugates and method of preparation and use. 4,218,539, Cl. 435-188.000.
Wener, Josef: *See—*
Kirsch, Bernhard; and Wener, Josef, 4,218,645, Cl. 322-47.000.
Wescom Switching, Inc.: *See—*
Pitroda, Satyan G.; and Min, Byung C., 4,218,589, Cl. 370-13.000.
West, William S. Pressure source. 4,218,192, Cl. 417-333.000.
Western Electric Company, Inc.: *See—*
Andrews, Edwin T., 4,218,025, Cl. 242-47.130.
Durr, Helmut E.; and Wright, James G., Jr., 4,218,285, Cl. 162-106.000.
Long, Allen K.; and Seibert, John M., 4,217,773, Cl. 73-15.600.
Westinghouse Electric Corp.: *See—*
Miller, Robert C., 4,218,614, Cl. 250-231.00R.
Sun, Shan C., 4,218,718, Cl. 361-79.000.
Teager, Robert S.; and Galvin, Richard S., 4,218,186, Cl. 416-95.000.
Westley, John: *See—*
Comai, Karen; Sullivan, Ann; and Westley, John, 4,218,443, Cl. 424-181.000.
Weyerhaeuser Company: *See—*
Abo El-Nil, Mostafa M., 4,217,730, Cl. 47-58.000.
Whalen, James T.: *See—*
Steinbergs, Arvey Z.; Taylor, Ray H.; and Whalen, James T., 4,218,592, Cl. 179-175.20D.
Whalen, John M., to Olin Corporation. Strip material center guide assembly. 4,218,002, Cl. 226-97.000.
Wheeler, Markham L. Funnel having an integral pouring spout. 4,217,940, Cl. 141-98.000.
Whelan, Joseph M.: *See—*
Hilbert, Robert A.; Kohl, William F., Jr.; Whelan, Joseph M.; and Apichella, John L., 4,218,058, Cl. 273-1.50R.
Wheldon, Alfred G.: *See—*
Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; and Wheldon, Alfred G., 4,218,491, Cl. 426-600.000.
Whitaker, Mervin A. Footwear. 4,217,704, Cl. 36-7.10R.
White, John F.: *See—*
Harris, Eugene G.; and White, John F., 4,218,379, Cl. 260-340.200.
Whitehouse, David J.; and Jungles, John, to Rank Organisation Limited, The. Measuring instruments. 4,218,144, Cl. 356-446.000.
Whitehouse, Stanley W. Drain lint separator and strainer. 4,217,667, Cl. 4-286.000.
Whitehurst, Darrell D.: *See—*
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,218,571, Cl. 585-277.000.
Whitling, Tom S. Restraint particularly suited for use as an aquatic training aid. 4,218,056, Cl. 272-71.000.

Whitman, Hobart A., III, to Olin Corporation. Apparatus for perforating webs with high intensity, coherent radiation. 4,218,606, Cl. 219-121.00L.
Wiegner, Georg; Schwolow, Hartmut; Klein, Dieter; and Malaskiewicz, Juergen, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Menstruation tampon. 4,217,900, Cl. 128-285.000.
Wiesbauer, Karl: *See*—
Schwenzfeier, Werner; Neff, Thomas; and Wiesbauer, Karl, 4,218,029, Cl. 242-56.900.
Wiesner, Paul: *See*—
Stonner, Hans-Martin; and Wiesner, Paul, 4,218,576, Cl. 568-751.000.
Wieweck, Gregory J. Biomass fueled furnace. 4,217,878, Cl. 126-110.00R.
Wight, Gary E. Boat bailing apparatus. 4,217,846, Cl. 114-185.000.
Wikstrom, Rolf, to Stal-Laval Turbin AB. Compact turbo machine. 4,218,180, Cl. 415-138.000.
Wilcox, Brian N.; and Robinson, John W., to Kimball International, Inc. Solo sustain keyer system. 4,217,801, Cl. 84-1.010.
Wildner, Horst: *See*—
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.
Wiles, Michael F.: *See*—
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mensch, William D., Jr.; Peddle, Charles I.; Schriber, Gene A.; and Wiles, Michael F., 4,218,740, Cl. 364-200.000.
Wilhelm, Richard E., to PPG Industries, Inc. Method of shaping moving sheets on roll forming apparatus. 4,218,232, Cl. 65-106.000.
William H. Rorer, Inc.: *See*—
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,218,450, Cl. 424-248.540.
Williams, James R., to General Motors Corporation. Cooling air control valve. 4,217,755, Cl. 60-39.750.
Williams, Thomas C.; and Totten, George E., to Union Carbide Corporation. Polymer composite articles containing amino substituted mercapto organo silicon coupling agents. 4,218,513, Cl. 428-419.000.
Willson, Karl S., to Minnesota Mining and Manufacturing Company. Self unified, heat sealable, multilayer film. 4,218,510, Cl. 428-349.000.
Wilson, Anton F., to Anton/Bauer, Inc. Battery pack connection. 4,218,107, Cl. 339-75.00P.
Wilson, Bradford W. Arm exerciser for runners. 4,218,057, Cl. 272-117.000.
Wilson, Melvin G.: *See*—
Herald, Robert F.; and Wilson, Melvin G., 4,218,643, Cl. 318-696.000.
Wilson, Phillip S.: *See*—
Mark, Victor; and Wilson, Phillip S., 4,218,357, Cl. 260-30.80R.
Wilson, Stanley, Jr.; and Borger, Robert M., to Potter Electric Signal Co. Detecting loop digital interface circuitry. 4,218,677, Cl. 340-506.000.
Wilwert, Eugene D.: *See*—
Golembeck, Gerald A.; and Wilwert, Eugene D., 4,217,840, Cl. 112-265.200.
Wing, Milton S.: *See*—
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., 4,218,383, Cl. 260-346.750.
Wingate, F. Everett: *See*—
Price, Harold A.; and Wingate, F. Everett, 4,218,411, Cl. 264-8.000.
Winslow, Charles E., Jr.: *See*—
Bostian, Logan C.; and Winslow, Charles E., Jr., 4,218,429, Cl. 423-515.000.
Winter, Hermann; Schroter, Gerhard; Jurgeleit, Wolfgang; Kalka, Josef; and Mihm, Bernhard, to Chemische Werke Huls Aktiengesellschaft. Polymerization of vinyl chloride with S_xO_y containing emulsifiers. 4,218,553, Cl. 526-209.000.
Winter, Michael R. C.: *See*—
Rolla, Gunnar; and Winter, Michael R. C., 4,218,434, Cl. 424-49.000.
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., to Warner-Lambert Company. 1-(4-Fluorophenyl)-4-[1,2,3,6-tetrahydro-4-(phenylthio)-1-pyridinyl]-butanones and related sulfoxides and sulfones. 4,218,455, Cl. 424-263.000.
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., to Warner-Lambert Company. 1-(4-Fluorophenyl)-4-(1,2,3,6-tetrahydro-4-phenoxy-1-pyridinyl)-butanones. 4,218,456, Cl. 424-263.000.
Witherow, Ross O. Drainage devices. 4,217,903, Cl. 128-349.00B.
Withrington, Roger J.; Cook, Lacy G.; and Jones, Helene H., to Hughes Aircraft Company. Holographic head-up displays. 4,218,111, Cl. 350-3.720.
Wolf, William: *See*—
Burr, John K.; and Wolf, William, 4,217,788, Cl. 74-425.000.
Wolfrum, Gerhard; Klauke, Erich; and Otten, Hans-Gunter, to Bayer Aktiengesellschaft. Water-soluble phenylazoaminonaphthol sulphonic acid dyestuffs. 4,218,373, Cl. 260-198.000.
Wolk, Reuben: *See*—
Jacob, Richard J.; and Wolk, Reuben, 4,218,420, Cl. 264-570.000.
Wood, Colin E. C., to U.S. Philips Corporation. Method of manufacturing semiconductor devices utilizing a sure-step molecular beam deposition. 4,218,271, Cl. 148-175.000.
Wood, Richard F., Jr., to DeLaval Turbine, Inc. Dual action trip and control valve. 4,217,814, Cl. 91-453.000.
Woodard, Kenneth E., Jr.: *See*—
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,218,275, Cl. 156-73.100.
Worsham, Daniel A.; and Schmidt, John D. Method for chasing game employing a set of timed sound generators. 4,218,676, Cl. 340-384.00E.
Wotton, John, to Angus Fire Armour Limited. Water sprinklers. 4,217,961, Cl. 169-41.000.
Wraighte, Patrick M.: *See*—
Mills, Frederick; Hopley, Eric T.; Curtis, Raymond; and Wraighte, Patrick M., 4,217,988, Cl. 215-21.000.
Wright, James G., Jr.: *See*—
Durr, Helmut E.; and Wright, James G., Jr., 4,218,285, Cl. 162-106.000.
Wunderlich, Dieter: *See*—
Egerbacher, Werner; Martin, Heinz; Mitzkus, Werner; and Wunderlich, Dieter, 4,218,695, Cl. 357-79.000.
Wust, Peter: *See*—
Schmidt-Roedenbeck, Heiner; Wust, Peter; and Wellern, Wilfried, 4,217,754, Cl. 60-39.28R.
Wustrow, Karl. Core for the making of castings equipped with slender ducts. 4,217,949, Cl. 164-370.000.
Wyatt, Michael A.: *See*—
Beckwith, Robert W.; and Wyatt, Michael A., 4,218,625, Cl. 307-87.000.
Wyburn-Mason, Roger, to Simoons, John R. A. Treatment of rheumatoid arthritis and related diseases. 4,218,449, Cl. 424-248.400.
Wymore, C. Elmer, to Dow Chemical Company, The. Oxydehydrogenation of alcohols. 4,218,401, Cl. 567-402.000.
Xerox Corporation: *See*—
Costanza, Daniel W.; and Muck, Dennis N., 4,218,127, Cl. 355-8.000.
Lu, Chin H., 4,218,530, Cl. 430-107.000.
Pacansky, Thomas J.; and Amidon, Alan B., 4,218,514, Cl. 428-447.000.
Silversberg, Morton, 4,218,125, Cl. 355-3.0BE.
Stange, Klaus K., 4,218,026, Cl. 242-55.000.
Yagi, Michio: *See*—
Nakagawa, Yasutsugu; and Yagi, Michio, 4,218,121, Cl. 354-271.000.
Yamada, Katuhiko: *See*—
Ito, Yoshio; Yamada, Katuhiko; Kitajima, Tadayuki; Miyamoto, Koichi; Kobayashi, Hiroo; and Tohyama, Yoshikuni, 4,218,131, Cl. 355-15.000.
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with automatic arpeggio performance device. 4,217,804, Cl. 84-1.030.
Yamagata, Toshio: *See*—
Ito, Susumu; Nagao, Morimasa; Yamagata, Toshio; and Hayama, Nobuyuki, 4,217,783, Cl. 73-720.000.
Yamaguchi, Kazumasa, to Kinsekisha Laboratory, Ltd. Electrode structure for thickness mode piezoelectric vibrating elements. 4,218,631, Cl. 310-312.000.
Yamahara Hatsudoki Kabushiki Kaisha: *See*—
Nishio, Kanemitsu; Suzuki, Takashi; Uenaga, Toshihiko; and Zega, Fumio, 4,217,873, Cl. 123-653.000.
Yamamoto Kagaku Gosei Co., Ltd.: *See*—
Watanabe, Koichi; Harada, Hiroaki; and Kotone, Akira, 4,218,432, Cl. 424-14.000.
Yamanouchi Pharmaceutical Co., Inc.: *See*—
Shiba, Kikuo, 4,218,435, Cl. 424-72.000.
Yamato, Noboru; and Satake, Tosimi, to Jujo Paper Co. Ltd. Heat-sensitive recording paper. 4,218,504, Cl. 428-207.000.
Yamazaki, Masaru: *See*—
Ishimoto, Osamu; Nishikawa, Masaji; and Yamazaki, Masaru, 4,218,129, Cl. 355-14.0SH.
Yan, Tsoung Y., to Mobil Oil Corporation. Method for NO_x removal from stack gases. 4,218,427, Cl. 423-239.000.
Yanagihara, Nobuyuki; Matsumoto, Isao; Ishitobi, Mamoru; and Iwaki, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing electrode for battery. 4,217,939, Cl. 141-1.100.
Yanagisawa, Shintaro: *See*—
Fukuyama, Toshihiko; and Yanagisawa, Shintaro, 4,218,291, Cl. 204-1.00T.
Yang, Kei-Hsiung; and Gruenke, Lothar A., to General Electric Company. Multi-copy ion-valve radiography. 4,218,619, Cl. 250-315.200.
Yasui, Yasuyoshi; Uno, Makoto; and Sanui, Yoshio, to Toyoda Jidosha Kogyo Kabushiki Kaisha. Lubricating device for final drive gearing of power transmission unit. 4,217,794, Cl. 74-700.000.
Yasukuni, Mitsuo: *See*—
Kawamura, Kunio; Yasukuni, Mitsuo; Iida, Takashi; and Suzuki, Yuziro, 4,218,120, Cl. 354-227.000.
Yates, Michael R.: *See*—
Edgar, Owen B.; and Yates, Michael R., 4,218,509, Cl. 528-339.000.
Yokoyama, Nobuo, to Nippon Oil Company, Ltd. Ink compositions for carbon paper. 4,218,252, Cl. 106-31.000.
Yokoyama, Nobuo: *See*—
Kawabata, Nobuaki; and Yokoyama, Nobuo, 4,218,263, Cl. 106-270.000.
Yoshida, Hajime, to Hajime Industries, Ltd. Pattern matching method and such operation system. 4,218,673, Cl. 340-146.3MA.
Yoshida Kogyo K. K.: *See*—
Seki, Fumio, 4,217,685, Cl. 29-408.000.
Yoshida Kogyo K.K.: *See*—
Sugimoto, Isao, 4,217,768, Cl. 68-20.000.
Yoshida, Noboru: *See*—
Atsumi, Toshio; Tarumi, Yuzo; and Yoshida, Noboru, 4,218,457, Cl. 424-263.000.

Yoshizawa, Keiichi, to TDK Electronics Company Limited. Compact hand-held demagnetizing device. 4,218,722, Cl. 361-149.000.

Young, Charles, Jr.; and Goo, Gee-In, to United States of America, Navy. Time delay firing device. 4,217,826, Cl. 102-200.000.

Young, William O., Jr.; and Jennings, Mansel A. Web edge decurling device and method for using same. 4,217,682, Cl. 26-98.000.

Yu, I-Ping: *See*—
United States of America, National Aeronautics and Space Administration; and Yu, I-Ping, 4,218,682, Cl. 343-700.0MS.

Z-L Limited Partnership: *See*—
Zilliken, Fritz W., 4,218,489, Cl. 426-545.000.

Zahn, Wolfgang: *See*—
Nagel, Erich; Zahn, Wolfgang; Kolbl, Heinz; Wildner, Horst; Ismann, Ernst; Bartel, Siegfried; Biedermann, Ernst; and Dreher, Karl, 4,218,032, Cl. 242-71.100.

Zahorsky, Carroll L. Drain construction. 4,217,904, Cl. 128-350.00R.

Zama, Takashi: *See*—
Takeuchi, Koji; Zama, Takashi; and Iwai, Shizuo, 4,218,261, Cl. 106-111.000.

Zaromb, Solomon. Apparatus for generating heat and electrical energy from aluminum waste and other inexpensive aluminum products. 4,218,520, Cl. 429-15.000.

Zech, Herbert: *See*—
Feist, Wolf-Dieter; and Zech, Herbert, 4,218,273, Cl. 156-60.000.

Zega, Fumio: *See*—
Nishio, Kanemitsu; Suzuki, Takashi; Uenaga, Toshihiko; and Zega, Fumio, 4,217,873, Cl. 123-653.000.

Zeitel, Joachim: *See*—
Bald, Hubert; and Zeitel, Joachim, 4,217,979, Cl. 198-419.000.

Zelina, John H., Jr., to Lighting Systems, Inc. Flasher circuit. 4,218,637, Cl. 315-313.000.

Zilliken, Fritz W., to Z-L Limited Partnership. Antioxidants, antioxidant compositions and methods of preparing and using same. 4,218,489, Cl. 426-545.000.

Zinn, Werner G., Jr., to Martin Marietta Corporation. Incremental digital shaft encoder. 4,218,615, Cl. 250-231.0SE.

Zolkind, Jack I. Arrangement for coupling a drill jig to an indexing apparatus. 4,218,161, Cl. 408-89.000.

Zucchini, Umberto; and Cuffiani, Illaro, to Montedison S.p.A. Catalyst components and catalysts for polymerizing olefins prepared from the catalysts. 4,218,339, Cl. 252-429.00B.

Zumfeld, Heinz: *See*—
Rohner, Joachim; Mauries, Reinhard; and Zumfeld, Heinz, 4,217,749, Cl. 57-261.000.

Zurn Industries, Inc.: *See*—
Gidner, Robert R., 4,217,921, Cl. 137-218.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF AUGUST, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bice, Archie R.; and Burchett, Donald K., to Du Pont de Nemours, E. I., and Company. Process for recovery of polymers from their dispersions in liquids. Re. 30,378, Cl. 528-486.000.

Burchett, Donald K.: *See*—
Bice, Archie R.; and Burchett, Donald K., Re. 30,378, Cl. 528-486.000.

Davis, Thomas E.: *See*—
Mirowski, Mieczyslaw; Denniston, Rollin H., III; and Davis, Thomas E., Re. 30,372, Cl. 128-49.00D.

Denniston, Rollin H., III: *See*—
Mirowski, Mieczyslaw; Denniston, Rollin H., III; and Davis, Thomas E., Re. 30,372, Cl. 128-49.00D.

Deuzeman, Hendrik H. J.; Lumley, Norman; and Santos, Ruben A., to Fiberglas Canada Ltd. Calcia catalyzed resins. Re. 30,375, Cl. 260-29.300.

Dickson, Donald E.: *See*—
Glunz, Louis J.; and Dickson, Donald E., Re. 30,376, Cl. 260-343.210.
Glunz, Louis J.; and Dickson, Donald E., Re. 30,377, Cl. 260-343.210.

Du Pont de Nemours, E. I., and Company: *See*—
Bice, Archie R.; and Burchett, Donald K., Re. 30,378, Cl. 528-486.000.

Fiberglas Canada Ltd.: *See*—
Deuzeman, Hendrik H. J.; Lumley, Norman; and Santos, Ruben A., Re. 30,375, Cl. 260-29.300.

Glunz, Louis J.; and Dickson, Donald E., to Thomas C. Elder, Inc. 8-Methoxypsoralen. Re. 30,376, Cl. 260-343.210.

Glunz, Louis J.; and Dickson, Donald E., to Thomas C. Elder, Inc. Process for making ω-chloro-2,3,4-trihydroxyacetophenone. Re. 30,377, Cl. 260-343.210.

Gordon, Paul, to Strategic Medical Research Corp. Ethereal monosubstitutions of monosaccharide derivatives. Re. 30,379, Cl. 536-4.000.

Lumley, Norman: *See*—
Deuzeman, Hendrik H. J.; Lumley, Norman; and Santos, Ruben A., Re. 30,375, Cl. 260-29.300.

Medtronic, Inc.: *See*—
Mirowski, Mieczyslaw; Denniston, Rollin H., III; and Davis, Thomas E., Re. 30,372, Cl. 128-49.00D.

Mirowski, Mieczyslaw; Denniston, Rollin H., III; and Davis, Thomas E., to Medtronic, Inc. Automatic cardioverting circuit. Re. 30,372, Cl. 128-49.00D.

Nist, Ferdinand J., Jr., to Seattle Box Company. Shipping bundle for numerous pipe lengths. Re. 30,373, Cl. 206-443.000.

Santos, Ruben A.: *See*—
Deuzeman, Hendrik H. J.; Lumley, Norman; and Santos, Ruben A., Re. 30,375, Cl. 260-29.300.

Seattle Box Company: *See*—
Nist, Ferdinand J., Jr., Re. 30,373, Cl. 206-443.000.

Spencer, Charles E. Method and apparatus for storing and displaying fruit. Re. 30,374, Cl. 414-404.000.

Strategic Medical Research Corp.: *See*—
Gordon, Paul, Re. 30,379, Cl. 536-4.000.

Thomas C. Elder, Inc.: *See*—
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Adams, Karen. Gymnasts hand grip. 256,401, 8-19-80, Cl. D2-361.000.

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CLASS 35

30 4,217,702

CLASS 36

7.1 R 4,217,704
29 4,217,705
110 4,217,706

CLASS 37

41 4,217,707
43 L 4,217,708
62 4,217,709

CLASS 40

156 4,217,710
308 4,217,711
334 4,217,712
488 4,217,713
549 4,217,714
591 4,217,715
607 4,217,716

CLASS 42

1 R 4,217,717

CLASS 43

6.5 4,217,718
15 4,217,719
17 4,217,720
43.2 4,217,721
114 4,217,722
122 4,217,723

CLASS 44

51 4,218,221

CLASS 46

22 4,217,724
44 4,217,725
120 4,217,726
257 4,217,727

CLASS 47

1.4 4,217,728
41 G 4,217,729
58 4,217,730

CLASS 48

202 4,218,222

CLASS 49

153 4,217,732
169 4,217,731

CLASS 51

103 R 4,217,733
118 4,217,734
158 4,217,735
284 E 4,217,736
334 4,217,737

CLASS 52

40 4,217,738
197 4,217,739
311 4,217,740
520 4,217,741
553 4,217,742

CLASS 53

54 4,217,743
55 4,217,744
531 4,217,745

CLASS 55

1 4,218,223
20 4,218,224
112 4,218,225
274 4,218,226
302 4,218,227
319 4,218,228

CLASS 56

14.4 4,217,746
203 4,217,747

CLASS 57

212 4,217,748
261 4,217,749
293 4,217,750

CLASS 60

39.28 R 4,217,754
39.75 4,217,755
262 4,217,756
288 4,217,757
404 4,217,758

CLASS 62

27 4,217,759
28 4,218,229
114 4,217,760
130 4,217,761
132 4,217,762
227 4,217,763
323 4,217,764
503 4,217,765

CLASS 64

1 V 4,217,766
32 R 4,217,767

CLASS 65

30 E 4,218,230
99 A 4,218,231
106 4,218,232

CLASS 68

20 4,217,768

CLASS 71

9 4,218,233
86 4,218,234
4,218,235
90 4,218,236
94 4,218,237
4,218,238
115 4,218,239

CLASS 72

53 4,217,769
349 4,217,770
358 4,217,771

CLASS 73

4 R 4,217,772
15.6 4,217,773
32 A 4,217,774
135 4,217,775
141 R 4,217,776
198 4,217,777
293 4,217,778
313 4,217,779
421 R 4,217,780
632 4,217,781
637 4,217,782
720 4,217,783
732 4,217,784
766 4,217,785

CLASS 74

1 SS 4,217,786
5.6 D 4,217,787
425 4,217,788
470 4,217,789
4,217,790
482 4,217,791
484 R 4,217,792
499 4,217,793
700 4,217,794
858 4,217,795
860 4,217,796

CLASS 75

0.5 AA 4,218,240
60 4,218,241
101 R 4,218,242
124 4,218,243
165 4,218,244
170 4,218,245

CLASS 76

101 A 4,217,797

CLASS 81

3.2 4,217,798

CLASS 82

1 C 4,217,799
2.5 4,217,800

CLASS 84

1.01 4,217,801
4,217,802
1.03 4,217,804
4,217,805
4,217,806
1.1 4,217,803
402 4,217,807
454 4,217,808

CLASS 86

19 4,217,809

CLASS 91

363 A 4,217,810
375 A 4,217,811
4,217,812
4,217,813
453 4,217,814

CLASS 93

37 R 4,217,815

CLASS 98

116 4,217,816

CLASS 99

349 4,217,817
456 4,217,818

CLASS 101

1 4,217,819
93.05 4,217,820
181 4,217,821
211 4,217,822
248 4,217,823
375 4,217,824
415.1 4,217,825

CLASS 102

200 4,217,826
214 4,217,827
249 4,217,828

CLASS 104

148 MS 4,217,829

CLASS 105

360 4,217,830

CLASS 106

1.12 4,218,248
2 4,218,249
3 4,218,250
30 4,218,251
31 4,218,252
43 4,218,253
44 4,218,254
45 4,218,255
58 4,218,256
73.5 4,218,257
93 4,218,258
98 4,218,259
4,218,260
111 4,218,261
206 4,218,262
270 4,218,263

CLASS 108

11 4,217,832

CLASS 109

19 4,217,833

CLASS 110

165 R 4,217,834

CLASS 111

85 4,217,835

CLASS 112

79 R 4,217,836
4,217,837
121.12 4,217,838
229 4,217,839
265.2 4,217,840
277 4,217,841
322 4,217,842

CLASS 113

121 C 4,217,843

CLASS 114

63 4,217,844
125 4,217,845
185 4,217,846
218 4,217,847
264 4,217,848

CLASS 116

212 4,217,849

CLASS 118

20 4,217,851
47 4,217,850
405 4,217,852
500 4,217,853
504 4,217,854
719 4,217,855
724 4,217,856

CLASS 119

1 4,217,857
4,217,858
20 4,217,859
27 4,217,860

CLASS 122

1 R 4,217,861

CLASS 123

41.14 4,217,864
47 A 4,217,865
188 S 4,217,875
350 4,217,867
416 4,217,868
432 4,217,866
438 4,217,869
472 4,217,862
494 4,217,863
501 4,217,871
572 4,217,870
594 4,217,874
596 4,217,872
653 4,217,873

CLASS 126

99 R 4,217,876
4,217,877
110 R 4,217,878
121 4,217,879
131 4,217,880
425 4,217,881
433 4,217,882
434 4,217,883
438 4,217,884
444 4,217,885
446 4,217,886
448 4,217,887
450 4,217,888

CLASS 128

1 R 4,217,889
4,217,890
6 4,217,891
49 D Re.30,372
66 4,217,892
89 R 4,217,893
213 R 4,217,894
214.4 4,217,895
218 PA 4,217,896
232 4,217,897
260 4,217,898
283 4,217,899
285 4,217,900
290 R 4,217,901
325 4,217,902
349 B 4,217,903
350 R 4,217,904
498 4,217,905
510 4,217,906
583 4,217,907
643 4,217,908
663 4,217,909
670 4,217,910
748 4,217,911
774 4,217,912
785 4,217,913

CLASS 132

7 4,217,914
9 4,217,915

CLASS 134

18 4,218,265
95 4,218,264
104 4,217,916
4,217,917
133 4,217,918
4,217,919
141 4,217,920

CLASS 136

209 4,218,266

CLASS 137

218 4,217,921
265 4,217,922
315 4,217,923
334 4,217,924
385 4,217,925
389 4,217,926
493.3 4,217,927
495 4,217,928
527.8 4,217,929
587 4,217,930
606 4,217,931
625.21 4,217,932
625.47 4,217,933
625.66 4,217,934

CLASS 138

109 4,217,935

CLASS 139

436 4,217,936

CLASS 140

92.1 4,217,937
4,217,938

CLASS 141

1.1 4,217,939
98 4,217,940
372 4,217,941

CLASS 148

1.5 4,218,267
38 4,218,268
171 4,218,269
175 4,218,270
4,218,271

CLASS 149

21 4,218,272

CLASS 152

209 B 4,217,943
209 R 4,217,942
323 4,217,944

CLASS 156

60 4,218,273
65 4,218,274
73.1 4,218,275
92 4,218,276
96 4,218,277
187 4,218,278
272 4,218,279
4,218,280
281 4,218,281
620 4,218,282
656 4,218,283

CLASS 160

236 4,217,945

CLASS 162

38 4,218,284
106 4,218,285
164 R 4,218,286

CLASS 164

12 4,217,946
87 4,217,947
115 4,217,948
370 4,217,949
426 4,217,950
448 4,217,951

CLASS 165

39 4,217,952
44 4,217,953
133 4,217,954

CLASS 166

252 4,217,955
272 4,217,956
273 4,217,957
274 4,217,958

CLASS 169

28 4,217,959
38 4,217,960
41 4,217,961

CLASS 172

197 4,217,962
804 4,217,963

CLASS 173

163 4,217,964

CLASS 174

23 C 4,218,577
35 R 4,218,578
48 4,218,579
107 4,218,580
117 F 4,218,581

CLASS 175

72 4,217,965
308 4,217,966

CLASS 178

22 4,218,582

CLASS 179

1 E 4,218,583
1 G 4,218,585
1 GS 4,218,586
1 ST 4,218,584
99 E 4,218,590
100.41 R 4,218,591

175.2 D 4,218,592

CLASS 180

20 4,217,967
133 4,217,968
175 4,217,969
298 4,217,970

CLASS 182

2 4,217,971

CLASS 187

8.41 4,217,972

CLASS 188

1 A 4,217,973
77 R 4,217,974

CLASS 191

13 4,217,975

CLASS 192

84 T 4,217,976

CLASS 198

341 4,217,977
345 4,217,978
419 4,217,979
666 4,217,980
839 4,217,981

CLASS 200

11 G 4,218,594
11 TW 4,218,593
61.54 4,218,595
144 R 4,218,596
148 R 4,218,597
153 J 4,218,598
159 B 4,218,600
159 R 4,218,599
4,218,601
302 4,218,602
312 4,218,603

CLASS 201

9 4,218,287
12 4,218,288

CLASS 202

161 4,218,289

CLASS 203

11 4,218,290

CLASS 204

1 T 4,218,291
55 R 4,218,292
95 4,218,293
159.13 4,218,294
159.23 4,218,295
181 C 4,218,296
195 F 4,218,299
195 M 4,218,298
195 S 4,218,297
247 4,218,300
251 4,218,301
299 R 4,218,302

CLASS 206

45.33 4,217,982
187 4,217,983
403 4,217,984
443 Re.30,373

CLASS 208

8 R 4,218,303
4,218,304
14 4,218,305
120 4,218,306
4,218,307
143 4,218,308
208 R 4,218,309

CLASS 209

214 4,218,310

CLASS 210

21 4,218,311
22 A 4,218,313
22 C 4,218,312
23 H 4,218,314
26 4,218,315
51 4,218,316
117 4,218,317
150 4,218,318
159 4,218,319
223 4,218,320
259 4,218,321
391 4,218,322
415 4,218,323
493 R 4,218,324
521 4,218,325

CLASS 211

50 4,217,985
57.1 4,217,986

CLASS 212

144 4,217,987

CLASS 215

21 4,217,988
253 4,217,989

CLASS 217

95 4,217,990

CLASS 219

61.7 4,218,604
70 4,218,605
121 L 4,218,606
301 4,218,607
368 4,218,608

CLASS 221

89 4,217,991
113 4,217,992

CLASS 222

14 4,217,993
212 4,217,994
327 4,217,995
404 4,217,996
604 4,217,997

CLASS 224

261 4,217,998
319 4,217,999
911 4,218,000

CLASS 226

97 4,218,001
4,218,002
104 4,218,003
149 4,218,004

CLASS 227

10 4,218,005

CLASS 228

48 4,218,006
194 4,218,007

CLASS 229

2.5 R 4,218,008
39 R 4,218,009
43 4,218,010

CLASS 235

76 4,218,609
92 PC 4,218,610
92 T 4,218,611
375 4,218,011
449 4,218,612

CLASS 239

10 4,218,012
74 4,218,013
106 4,218,014
147 4,218,015
186 4,218,016
242 4,218,017
284 A 4,218,018
290 4,218,019
406 4,218,020
585 4,218,021

CLASS 241

101.7 4,218,022
121 4,218,023
185 R 4,218,024

CLASS 242

47.13 4,218,025
55 4,218,026
55.2 4,218,027
4,218,028
56.9 4,218,029
67.2 4,218,030
67.3 R 4,218,031
71.1 4,218,032
107.4 A 4,218,033

CLASS 244

114 R 4,218,034
122 AC 4,218,035

CLASS 248

475 B 4,218,036
481 4,218,037

CLASS 249

160 4,218,038
214 4,218,039

CLASS 250

211 J 4,218,618
214 A 4,218,613
223 R 4,218,616
231 R 4,218,614
231 SE 4,218,615
305 4,218,617
315.2 4,218,619
338 4,218,620
492 A 4,218,621
518 4,218,622
578 4,218,623

CLASS 251

28 4,218,040
127 4,218,041
288 4,218,042

CLASS 252

8.55 D 4,218,326
4,218,327
33.3 4,218,328
46.4 4,218,329
46.6 4,218,330
48.6 4,218,331
4,218,332
316 4,218,333
356 4,218,334
408 4,218,335
411 R 4,218,336
4,218,337
415 4,218,338
429 B 4,218,339
429 R 4,218,340
430 4,218,341
431 C 4,218,342
435 4,218,343
455 Z 4,218,344
458 4,218,345
475 4,218,346
522 4,218,348
522 R 4,218,347

CLASS 254

35 4,218,043
93 R 4,218,044
266 4,218,046
323 4,218,045

CLASS 256

1 4,218,047

CLASS 260

5 4,218,349
17.4 ST 4,218,350
18 N 4,218,351
23 XA 4,218,352
28.5 D 4,218,353
29.2 M 4,218,354
29.3 Re.30,375
29.4 R 4,218,355
29.6 TA 4,218,356
30.8 R 4,218,357
32.6 N 4,218,358
33.8 SB 4,218,359
37 EP 4,218,360
38 4,218,361
40 R 4,218,362
42.14 4,218,363
45.7 P 4,218,364
45.75 C 4,218,365
146 R 4,218,367
156 4,218,368
157 4,218,369
192 4,218,370
4,218,371
196 4,218,372
198 4,218,373
245.2 R 4,218,374
314.5 4,218,376
326.22 4,218,377
330.3 4,218,375
333 4,218,378
340.2 4,218,379
340.5 R 4,218,380
343.21 Re.30,376
Re.30,377
343.6 4,218,381
346.75 4,218,382
4,218,383
404 4,218,384
408 4,218,385
415 4,218,386
449 R 4,218,388
449.5 4,218,389
453 AB 4,218,390
463 4,218,391
465 D 4,218,392
465.6 4,218,393
465.8 R 4,218,394
507 R 4,218,395
546 4,218,402
552 R 4,218,396
555 A 4,218,397
561 R 4,218,398
583 P 4,218,399
944 4,218,404
967 4,218,405

CLASS 261

39 B 4,218,406
64 R 4,218,407
112 4,218,408

CLASS 264

4 4,218,409
8 4,218,410
4,218,411
11 4,218,412
13 4,218,413
40.4 4,218,414
46.4 4,218,415
167 4,218,416
275 4,218,417
299 4,218,418
334 4,218,419
570 4,218,420

CLASS 266

236 4,218,048
243 4,218,049
281 4,218,050

CLASS 269

131 4,218,051

CLASS 270

71 4,218,052
4,218,053

CLASS 271

11 4,218,054
106 4,218,055

CLASS 272

4,218,056
71 4,218,057
117

CLASS 273

1.5 R 4,218,058
25 4,218,059
55 R 4,218,060
108 4,218,062
237 4,218,063
364 4,218,061
428 4,218,064

CLASS 274

9 R 4,218,065

CLASS 277

53 4,218,066
205 4,218,067

CLASS 279

1 L 4,218,068

CLASS 280

11.12 4,218,069
28.5 4,218,070
630 4,218,071
689 4,218,072
731 4,218,073
801 4,218,074
804 4,218,075
4,218,076

CLASS 283

2 4,218,077

CLASS 285

115 4,218,078
331 4,218,079
347 4,218,080

CLASS 290

45 4,218,624

CLASS 292

66 4,218,081
173 4,218,082
262 4,218,083
341.19 4,218,084

CLASS 294

20 4,218,085
87.2 4,218,086

CLASS 296

100 4,218,087
137 R 4,218,088

CLASS 297

58 4,218,089
214 4,218,090
354 4,218,091
367 4,218,092
439 4,218,093

CLASS 298

17 B 4,218,094

CLASS 299

87 4,218,095

CLASS 300

3 4,218,096

CLASS 301

5 B 4,218,097
5.7 4,218,098
37 R 4,218,099

CLASS 303

119 4,218,100

CLASS 305

35 EB 4,218,101

CLASS 307

87 4,218,625
116 4,218,626
311 4,218,627
426 4,218,628

CLASS 308

174 4,218,102

CLASS 310

11 4,218,629
260 4,218,630
312 4,218,631

CLASS 312

211 4,218,103
214 4,218,104
291 4,218,105

CLASS 313

218 4,218,632
362 4,218,633

CLASS 315

16 4,218,634
17 4,218,635
169.1 4,218,636
313 4,218,637
397 4,218,638

CLASS 318

6 4,218,639
331 4,218,640
341 4,218,641
696 4,218,642
4,218,643

CLASS 320

21 4,218,644

CLASS 322

47 4,218,645
72 4,218,646

CLASS 323

9 4,218,647
18 4,218,648

CLASS 324

54 4,218,649
62 4,218,650
227 4,218,651
253 4,218,652
421 4,218,653

CLASS 328

109 4,218,658

CLASS 330

6 4,218,659
297 4,218,660

CLASS 331

116 FE 4,218,661

CLASS 333

14 4,218,662
17 L 4,218,663
156 4,218,664
165 4,218,665
211 4,218,666

CLASS 335

212 4,218,667
216 4,218,668
258 4,218,669

CLASS 337

349 4,218,670

CLASS 339

32 R 4,218,106
75 P 4,218,107
82 4,218,108
147 R 4,218,109
154 A 4,218,110

CLASS 340

21 4,218,671
52 R 4,218,672
65 4,218,763
146.3 MA 4,218,673
149 A 4,218,674
149 R 4,218,690
347 AD 4,218,675
384 E 4,218,676
506 4,218,677

CLASS 343

5 FT 4,218,678
6.5 R 4,218,679
6.8 R 4,218,680
700 MS 4,218,682
703 4,218,683
715 4,218,684
727 4,218,685
819 4,218,686
885 4,218,687

CLASS 346

74.1 4,218,688
135.1 4,218,689
153 4,218,691

CLASS 350

3.72 4,218,111
8 4,218,112
96.21 4,218,113
292 4,218,114

CLASS 352

7 4,218,115
22 4,218,116
72 4,218,117

CLASS 353

110 4,218,118

CLASS 354

23 D 4,218,119
227 4,218,120
271 4,218,121
293 4,218,122
310 4,218,123

CLASS 355

3 BE 4,218,125
3 R 4,218,126
3 SC 4,218,124
8 4,218,127
14 R 4,218,130
14 SH 4,218,128
4,218,129
15 4,218,131
4,218,132
56 4,218,133
71 4,218,134
72 4,218,135
79 4,218,136
92 4,218,137

CLASS 356

152 4,218,138
218 4,218,139
226 4,218,140
246 4,218,141
394 4,218,142
445 4,218,143
446 4,218,144

CLASS 357

19 4,218,692
41 4,218,693
72 4,218,701
76 4,218,694
79 4,218,695

CLASS 358

8 4,218,696
13 4,218,697
22 4,218,698
29 4,218,699
31 4,218,700
109 4,218,702
113 4,218,707
136 4,218,703
4,218,704
149 4,218,705
172 4,218,706
178 4,218,708
181 4,218,709
183 4,218,710
4,218,711
229 4,218,712

CLASS 360

36 4,218,713
99 4,218,714
103 4,218,715

CLASS 361

37 4,218,716
79 4,218,717
4,218,718
82 4,218,719
93 4,218,720
117 4,218,721
149 4,218,722
321 4,218,723
395 4,218,724

CLASS 362

20 4,218,725
23 4,218,726
297 4,218,727

CLASS 363

54 4,218,728
4,218,729
124 4,218,730
136 4,218,731
160 4,218,732

CLASS 364

105 4,218,733
118 4,218,734

200 4,218,735
4,218,738
4,218,739
4,218,740
4,218,741
4,218,742
4,218,743
442 4,218,744
483 4,218,736
489 4,218,745
493 4,218,737
571 4,218,746
716 4,218,747
717 4,218,748
4,218,749
770 4,218,750
784 4,218,751
825 4,218,752
900 4,218,753
4,218,754
4,218,755
4,218,756
4,218,757
4,218,758
4,218,759
4,218,760

CLASS 365

4 4,218,761
32 4,218,762
222 4,218,764

CLASS 366

18 4,218,145
78 4,218,146
162 4,218,147

CLASS 367

45 4,218,765
47 4,218,766
79 4,218,767
105 4,218,768

CLASS 368

76 4,217,751
289 4,217,752
324 4,217,753

CLASS 370

13 4,218,589
59 4,218,588
81 4,218,587
97 4,218,654

CLASS 375

95 4,218,769
118 4,218,770
120 4,218,771

CLASS 400

124 4,218,148
4,218,149
4,218,150
314.1 4,218,151

CLASS 401

2 4,218,152
67 4,218,153
107 4,218,154
132 4,218,155

CLASS 403

320 4,218,156

CLASS 404

6 4,218,157

CLASS 405

170 4,218,158

CLASS 407

25 4,218,159
114 4,218,160

CLASS 408

89 4,218,161
188 4,218,162
196 4,218,163

CLASS 409

131 4,218,164
225 4,218,165

CLASS 410

121 4,217,831

CLASS 414

1 4,218,166
9 4,218,167
139 4,218,168
404 Re.30,374
523 4,218,169
666 4,218,170
694 4,218,171
730 4,218,172
4,218,173
786 4,218,174

CLASS 415

2 4,218,175
90 4,218,176
4,218,177
114 4,218,178
4,218,179
138 4,218,180
189 4,218,181
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4 :	4,218,027		4,218,091		4,218,005		4,217,724		4,218,438		4,218,418
6 :	4,217,669		4,218,111		4,218,085		4,217,746		4,218,475		4,218,477
	4,217,690		4,218,122		4,218,148		4,217,766		4,218,649		4,218,583
	4,217,699		4,218,150		4,218,187		4,217,790		4,218,657		4,218,627
	4,217,847		4,218,165		4,218,258		4,217,843	19 :	4,217,835		4,218,655
	4,218,274		4,218,175		4,218,301		4,217,911		4,217,864		4,218,687
	4,218,299		4,218,177		4,218,405		4,217,944		4,217,987		4,218,709
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	4,218,411		4,218,197		4,218,610		4,217,968		4,218,157		4,218,739
	4,218,423		4,218,207		4,218,727		4,217,982		4,218,183		4,218,753
	4,218,493		4,218,256	10 :	4,218,059		4,217,989		4,218,607		4,218,754
	4,218,558		4,218,264		4,218,371		4,217,993	20 :	4,217,729	26 :	Re.30,374
8 :	4,217,807		4,218,267		4,218,448		4,218,034		4,218,009		4,217,668
	4,218,039		4,218,290		4,218,485		4,218,043	21 :	4,217,972		4,217,706
9 :	4,217,670		4,218,302	11 :	4,218,525		4,218,064		4,218,305		4,217,719
	4,218,002		4,218,309		4,218,763		4,218,068		4,218,544		4,217,723
	4,218,066		4,218,310	12 :	4,217,715		4,218,086		4,218,547		4,217,771
	4,218,385		4,218,324		4,217,764		4,218,094		4,218,616		4,217,792
01 :	4,218,060		4,218,326		4,217,815		4,218,105	22 :	4,217,782		4,217,811
	4,218,168		4,218,402		4,217,885		4,218,115		4,218,084		4,217,812
04 :	4,217,742		4,218,439		4,217,902		4,218,147	23 :	4,218,008		4,217,813
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	4,218,206		4,218,454		4,218,011		4,218,185		4,217,722		4,217,877
	4,218,578		4,218,465		4,218,198		4,218,195		4,217,798		4,217,892
	4,218,680		4,218,503		4,218,208		4,218,332		4,217,826		4,217,908
	4,218,740		4,218,535		4,218,226		4,218,342		4,217,858		4,217,920
06 :	4,217,676		4,218,554		4,218,259		4,218,344		4,218,058		4,217,926
	4,217,695		4,218,582		4,218,313		4,218,345		4,218,063		4,217,964
	4,217,720		4,218,592		4,218,356		4,218,363		4,218,067		4,217,969
	4,217,725		4,218,628		4,218,365		4,218,407		4,218,077		4,217,970
	4,217,726		4,218,648		4,218,497		4,218,416		4,218,114		4,217,978
	4,217,727		4,218,658		4,218,612		4,218,441		4,218,307		4,217,992
	4,217,737		4,218,669		4,218,615		4,218,442		4,218,624		4,217,996
	4,217,817		4,218,676		4,218,620		4,218,481		4,218,664		4,218,019
	4,217,886		4,218,682		4,218,625		4,218,492		4,218,737		4,218,021
	4,217,887		4,218,683		4,218,688		4,218,521	25 :	4,217,702		4,218,051
	4,217,889		4,218,685		4,218,741		4,218,574		4,217,716		4,218,073
	4,217,890		4,218,690		4,218,760		4,218,586		4,217,772		4,218,074
	4,217,898		4,218,715	13 :	4,217,773		4,218,589		4,217,780		4,218,075
	4,217,925		4,218,717		4,217,897		4,218,723		4,217,785		4,218,076
	4,217,928		4,218,742		4,217,983		4,218,775		4,217,797		4,218,088
	4,217,965		4,218,745		4,218,099	18 :	4,217,717		4,217,803		4,218,092
	4,217,977		4,218,747		4,218,217		4,217,721		4,217,845		4,218,093
	4,217,986		4,218,758		4,218,285		4,217,741		4,217,861		4,218,166
	4,217,998		4,218,759		4,218,748		4,217,755		4,217,884		4,218,176
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	4,218,057		4,218,518	17 :	Re.30,376		4,217,938		4,218,142		4,218,224
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	4,218,082		4,218,587		Re.30,379		4,218,020		4,218,186		4,218,329
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	4,218,090		4,217,681		4,217,679		4,218,238		4,218,294		4,218,354
			4,217,686		4,217,701		4,218,357		4,218,295		4,218,378

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